AMERICAN GAS ASSOCIATION MONTHLY

AUGUST · 1934

Association Officers Are Nominated

•

A. G. A. To Aid Fire Prevention Week Campaign *T. Alfred Fleming*

•

Importance of Research To Develop A. G. A. Standards *F. O. Suffron*

•

1934 Convention To Feature Exhibit

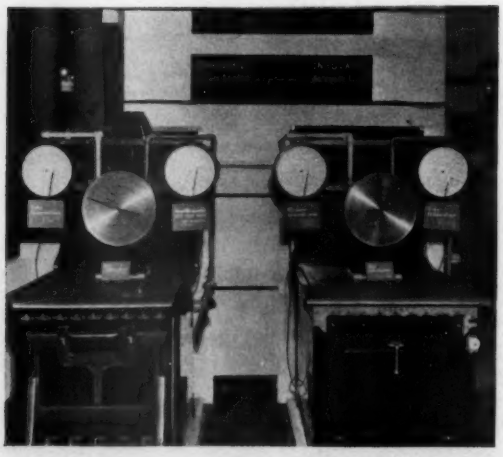
YOUR GAS COMPANY

wants to help you save money

IN YOUR KITCHEN

STARTLING economies have resulted from kitchen-cost surveys conducted in hotels and restaurants by America's gas companies. Improvements in gas cooking equipment have been so effective in cutting cooking costs that new installations can be depended upon not only to pay for themselves quickly but to yield handsome dividends year after year. »» Your gas company will be glad to demonstrate the savings which *you* can effect. Call up at once. Ask for a cooking-cost engineer to make a survey of *your* kitchen. No charge. No obligation. And no guess-work.

HOTEL AND RESTAURANT COMMITTEE • AMERICAN GAS ASSOCIATION



44% saving in fuel

100° less heat radiation . . . Public tests have recently brought out in a most spectacular way the economy of modern gas cooking equipment. »» In each test a pair of heavy duty ranges was used. One range was equipped with an insulated oven and automatic heat control. The other was not. »» Accurate instruments recorded the results: as much as 44% less gas was used to do the same oven work with modern equipment; and the temperature of the outside of the range was reduced as much as 100°. »» If you want to cut down *your* cooking costs and keep *your* kitchen cooler, ask your gas company to survey and report on your equipment.

Third of a series of advertisements prepared by the Hotel and Restaurant Committee, Industrial Gas Section, American Gas Association, as it will appear in hotel and restaurant trade papers.

AMERICAN GAS ASSOCIATION MONTHLY

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SUBSCRIPTION RATE : $3.00 A YEAR

A portion of the East Wall of the gas industry's exhibit at the Century of Progress Exposition, Chicago. Four niches are in this wall, each containing a modern gas range in bright enamelled colors, surrounded by harmonizing shades. Above the four ranges appear the words, "Efficiency," "Quality," "Beauty" and "Style."

AMERICAN GAS
ASSOCIATION
MONTHLY

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Allyn B. Tunis, Editor

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Exhibit Again To Be Feature At Atlantic City Convention

NEARLY 150 manufacturers of gas appliances and equipment, whose products will be displayed at the Sixteenth Annual Convention and Exhibition of the American Gas Association, which will take place at Atlantic City, N. J., October 29 to November 2, had been assigned space last month by the Exhibition Committee, and the number was still mounting.

The Convention and Exhibition again will take place in Atlantic City's celebrated Auditorium. Few buildings anywhere can offer the facilities provided by the Atlantic City Auditorium for the entertainment of conventions and the display of exhibits.

Under the roof of this giant structure will be assembled gas appliances and equipment of the newest types. Manufacturers claim that greater advance in improvements has been made in gas-burning appliances in the last three years than in the previous fifteen. This will be the first display of its kind in three years, and will be staged in ideal surroundings so that the progress made in the development of ranges, water heaters, house heating equipment, refrigerators, air-conditioning units, and other domestic and industrial equipment may be viewed to the best possible advantage.

Manufacturers are enthusiastic over the forthcoming exhibition and promise a show that will eclipse all past performances. Engineers, commercial men, home service workers, in fact all identified with the industry are just as eager to see the latest things as the manufacturers are to show them. For the accountants, there will be a special section of the exhibit devoted to office equipment and devices.

Executives, heads of departments and others in company organizations will make their contributions during the programs of General Sessions, Departmental and Sectional meetings. Papers will deal with important national questions at present before the gas industry, as well as with plans for increasing sales, and also with practical operating subjects.

Three General Sessions will be held—Tuesday, Wednesday and Thursday mornings, the week of the convention. These will take place in the ballroom, which has a seating capacity of 5,000 people. Meetings of the Commercial Section are scheduled for Tuesday and Wednesday afternoons, and sessions of the Industrial Gas Section are set for the same time.

The Accounting Section plans to hold meetings Tuesday and Thursday afternoons with a luncheon conference Wednesday afternoon at the Ritz Carlton.

Meetings of the Technical Section will take place Tuesday and Wednesday afternoons.

The Convention really will get down to business when the Natural Gas Department meets Monday morning at the Ambassador Hotel.

Entertainment features will be presented Tuesday, Wednesday and Thursday evenings.

A brief session of the Manufacturers Section will take place Sunday, October 28. This date was agreed upon so that the manufacturers might be free to devote their entire time to the exhibit opening Monday morning.

Programs for all meetings are well-advanced, and members who attend are promised a noteworthy business program.

Members planning to attend the Convention and Exhibition are urged to make their hotel reservations promptly. Headquarters last month mailed to all members an Atlantic City hotel rate list, with the request that reservations be forwarded directly to Robert W. Wiederwax, chairman, Hotel Convention Committee, American Gas Association,

Suite 16, Central Pier, Atlantic City, N. J. All correspondence in connection with hotel reservations should be addressed to Mr. Wiederwax.

Reduced railroad rates to and from Atlantic City again will be available to A. G. A. members and dependent members of their families. Details of this soon will be mailed direct to members.

The whole convention program is being arranged with a view of giving ample time to all members to carefully inspect the exhibit. The list of exhibitors to date follows:

A-B Stove Co., Battle Creek, Mich.; Addressograph-Multigraph Corp., Cleveland, Ohio; Alcazar Range & Heater Co., Milwaukee, Wis.; Air Reduction Sales Co., New York, N. Y.; Alpha-Lux Co. Inc., New York, N. Y.; American Brass Co., Waterbury, Conn.; American Cast Iron Pipe Co., Birmingham, Ala.; American Gas Journal, New York, N. Y.; American Gas Products Corp., New York, N. Y.; American Meter Co., New York, N. Y.; American Stove Co., Cleveland, Ohio; American Thermometer Co., St. Louis, Mo.; Autogas Corporation, Chicago, Ill.; Automatic Products Co., Milwaukee, Wis.

Bailey Meter Co., Cleveland, Ohio; Barber Gas Burner Co., Cleveland, Ohio; Bartlett Hayward Co., Baltimore, Md.; Blodgett Co., Inc., G. S., Burlington, Vt.; Bristol Co., Waterbury, Conn.; Bryant Heater Co., Cleveland, Ohio; Burdett Mfg. Co., Chicago, Ill.; Burnham Boiler Corp., Irvington, N. Y.; Burroughs Adding Machine Co., Detroit, Mich.

Caloric Gas Stove Works, Philadelphia, Pa.; Canadian Gas Association-Intercolonial Gas Journal of Canada; Carson-Cadillac Corp., Birmingham, Ala.; Chace Valve Co., W. M., Detroit, Mich.; Chambers Corp., Shelbyville, Ind.; Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.; Cleveland Co-Operative Stove Co., Cleveland, Ohio; Cleveland Gas Meter Co., Cleveland, Ohio; Cleveland Heater Co., Cleveland, Ohio; Cleveland Trencher Co., Cleveland, Ohio; Connelly Iron Sponge & Governor Co., Elizabeth, N. J.; Coxhead Corp., Ralph C., New York, N. Y.; Crane Co., Chicago, Ill.; Cribben & Sexton Co., Chicago, Ill.; Cruse-Kemper Co., Ambler, Pa.; Cutler-Hammer Inc., Milwaukee, Wis.

Dearborn Chemical Co., Chicago, Ill.; Detroit Lubricator Co., Detroit, Mich.; Detroit-Michigan Stove Co., Detroit, Mich.; Dresser Mfg. Co., S. R., Bradford, Pa.

Economy Governor Co., Anderson, Ind.; Electrolux Refrigerator Sales Inc., New York, N. Y.; Elliott Addressing Machine Co., Cambridge, Mass.; Ensign-Reynolds Inc., New York, N. Y.; Estate Stove Co., Hamilton, Ohio.

Fagan-Andrews Co., Milwaukee, Wis.; Floyd-Wells Co., Royersford, Pa.

Gas Purifying Materials Co. Inc., Long Island City, N. Y.; General Ceramics Co., New York, N. Y.; General Coal Co., Philadelphia, Pa.; General Electric Co., New York, N. Y.; General Gas Light Co., Kalamazoo, Mich.; Glenwood Range Co., Taunton, Mass.; Globe American Corp., Kokomo, Ind.

Handley Brown Heater Co., Jackson, Mich.; Harper Wyman Mfg. Co., Chicago, Ill.; Homestead Heater Co., Newark, N. J.

Improved Equipment-Russell Engineering Corp., New York, N. Y.; International Business Machines Corp., New York, N. Y.; International Nickel Co. Inc., New York, N. Y.

Johns-Manville, Inc., New York, N. Y.

Kitson Co., Philadelphia, Pa.

Lambert Meter Co., Brooklyn, N. Y.; Lattimer-Stevens Co., Columbus, Ohio; Lavino & Co., E. J., Philadelphia, Pa.; Littleford Bros., Cincinnati, Ohio; Lindemann & Hoverson Co., A. J., Milwaukee, Wis.; Lovekin Water Heater Co., Philadelphia, Pa.

Majestic Mfg. Co., St. Louis, Mo.; McWane Cast Iron Pipe Co., Birmingham, Ala.; Mears-Kane-Ofeldt Inc., Philadelphia, Pa.; Mettler Co., Lee B., Los Angeles, Calif.; Milwaukee Gas Specialty Co., Milwaukee, Wis.; Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.; Moore Corp., Joliet, Ill.; Mueller Co., Decatur, Ill.; Mulcare Engineering Co. Inc., New York, N. Y.

National Cash Register Co., Dayton, Ohio; National Radiator Corp., Johnstown, Pa.; National Superior Co., Toledo, Ohio; National Tube Co., Pittsburgh, Pa.; Natural Gas Magazine, Cincinnati, Ohio.

Patrol Valve Co., Cleveland, Ohio; Peerless Heater Co., Boyertown, Pa.; Peerless Mfg. Corp., Louisville, Ky.; Penn Electric Switch Co., Des Moines, Iowa; Pennsylvania Furnace & Iron Co., Warren, Pa.; Pittsburgh Coal Co., Pittsburgh, Pa.; Pittsburgh Equitable Meter Co., Pittsburgh, Pa.; Pittsburg Water Heater Co., Pittsburgh, Pa.; Public Utilities Reports Inc., Washington, D. C.

Remington Rand Inc., Buffalo, N. Y.; Reynolds Gas Regulator Co., Anderson, Ind.; Robbins Publishing Co., New York, N. Y.; Roberts & Mander Stove Co., Philadelphia, Pa.; Roberts Brass Mfg. Co., Detroit, Mich.; Roberts-Gordon Appliance Corp., Buffalo, N. Y.; Robertshaw Thermostat Co., Youngwood, Pa.; Roper Corp., Geo. D., Rockford, Ill.; Ruud Manufacturing Co., Pittsburgh, Pa.

Safety Gas Main Stopper Co. Inc., Brooklyn, N. Y.; Sands Mfg. Co., Cleveland, Ohio; Semet-Solvay Engineering Corp., New York, N. Y.; Skinner Co., M. B., South Bend, Ind.; Smith Mfg. Co., The A. P., East Orange, N. J.; Spencer Thermostat Co., Attleboro, Mass.; Sprague Meter Co., Bridgeport, Conn.; Stacey Bros. Gas Construction Co., New York, N. Y.; Standard Gas Equipment Corp., New York, N. Y.; Superior Meter Co., Brooklyn, N. Y.; Surface Combustion Corp., Toledo, Ohio.

Tappan Stove Co., Mansfield, Ohio; Therminsul Corporation of America, Kalamazoo, Mich.; Thrush & Co., H. A., Peru, Ind.; Tinnerman Stove & Range Co., Cleveland, Ohio.

United American Bosch Corp., Springfield, Mass.; United Engineers & Constructors Inc., Philadelphia, Pa.; United States Bureau of Standards, Washington, D. C.; United States Pipe & Foundry Co., Burlington, N. J.

Wailes Dove-Hermiston Corp., New York, N. Y.; Watts Regulator Co., Lawrence, Mass.; Welsbach Co., Gloucester, N. J.; Western Gas Construction Co., Fort Wayne, Ind.; Whitehead Metal Products Co. of N. Y., New York, N. Y.; Wood Mfg. Co., John, Conshohocken, Pa.; Wilcolator Co., Newark, N. J.; Wood Co., R. D., Philadelphia, Pa.

Youngstown Sheet & Tube Co., Youngstown, Ohio.

A.G.A. To Aid Fire Prevention Week

By T. ALFRED FLEMING
Chairman, International Committee for Fire Prevention Week

THE remarkable development of interest and enthusiasm noted in recent years in connection with the campaign of Fire Prevention Week has been secured largely because of the individual support by trade associations. To a responsible degree, the great reduction of fire losses in 1933 was occasioned by activities beginning during Fire Prevention Week, which always falls on the week including October 9, the anniversary of the Chicago Fire, and continuing throughout the entire year.

Here is an opportunity for organized utilities associated with the American Gas Association, not only to assist in this great national movement for conservation but also in the development of public relations for its own individual company. All utilities are interested in the conservation of property and life from fire. The gas industry, in particular, has much to gain from the education of the public in safeguarding against possible fire hazards, chiefly resulting from lack of knowledge on the part of the general public. The gas industry, through its Laboratory, has made great strides toward the safety of gas utilizing devices. The American Gas Association, with its affiliated organizations, has always been interested in fire safety and has used its engineering force in securing approved devices and proper and safe installations.

Industry Can Play Vital Part

Fire Prevention Week gives to gas and utility companies an opportunity to profit by the work of their own trade association and laboratories by fostering a campaign for the education of the public in the correct use of their products. They can by cooperation with this movement and without additional expense, not only improve their own fire record by impressing the public but improve their public relations standing by taking a vital part in the general campaign in their home cities.

Over 700 cities in the United States have organized fire prevention committees, generally operating through the chamber of commerce of each municipality.

Here are a few activities in which the gas companies may take part:

Window displays may be arranged for the week calling the attention of the public to approved devices as compared with those which may be considered in some degree hazardous. Window displays always attract large crowds. A great number of the people congregated will examine the different equipment on exhibition both in the window display and in the show room. This gives an opportunity for explanation of the various features of safety which are advocated.

Safety rules for the home may be prepared on a small slip, to be included with gas bills; thus the campaign is carried into every home of the city that is served.

Meter readers always have opportunities of noting conditions in basements. Hazardous conditions found may be reported confidentially to the fire prevention committee, and will finally be acted on by the proper authorities. This program has been carried on by many gas companies with the best of results.

In one city the gas and electric companies joined in fostering an essay contest on safe use of gas and electricity.

Prominent display of Fire Prevention Week announcement should be made in all advertising material and space used in local newspapers.

These are only a few suggestions. Each company may plan its activity to fulfill what is considered its greatest need.

The public has been accustomed to the use of city gas for so many years that any inherent hazards due to careless use are largely ignored. This is evidenced by the common failure of most householders to report leakage of gas to the local company. It is frequently found that a householder will put up with the odor of leaking gas rather than make a simple effort to notify the gas company of the imperfection in the house system. Failure on the part of the householder to report such leaks sometimes brings disastrous explosions.

Another violation of safe practice consists of the tendency on the part of the average householder to make his own installation of small gas consuming devices, such as gas plates in auxiliary kitchens or basements. When this is done the joints are not properly made and frequently unauthorized connections are employed, all of which means possible gas leakage and consequent danger.

In some parts of the country home owners will install a gas-fired hot water heater in a bathroom. Often there is no vent arranged for the fumes and the users are not advised as to the possible danger incurred. This practice leads to fatalities by asphyxiation or carbon monoxide poisoning, and frequently fires. These devices are sometimes installed in basements without flue connections, with similar hazard.

Automatic Pilot A Boon

Within the past few years, the automatic gas pilot light has been developed to a point where it is positive and reliable in operation. Practically all concerns manufacturing devices employ this automatic means of shutting off gas in case of the extinguishment of the burner flame.

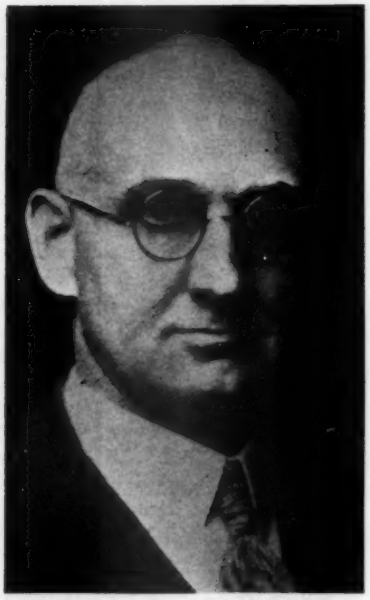
Fire Prevention Week supplies an opportunity to educate the public as to the need of such improvements.

The celebration of this week will also give an opportunity to engineers or inspectors of each company to address gatherings, such as Rotary or Kiwanis clubs, chambers of commerce, safety groups and women's organizations on salient features of safety which are considered most important.

In the campaign for this year we are expecting all associated companies of the American Gas Association to plan and carry out a very definite educational program and to do so in full cooperation with the activities arranged for in their home cities.

A full and complete report should be mailed to the American Gas Association which, in turn, will report for the trade industry to the International Committee for Fire Prevention Week.

A. G. A. Nominating Committee Reports for 1934-1935



P. S. Young

To Members of the American Gas Association:

IN compliance with Section 2 of Article II of the By-Laws of the American Gas Association, announcement is hereby made to the membership of the following recommendations of the General Nominating Committee which they will report to the annual convention in Atlantic City, N. J., in October, 1934:

L. B. Denning

For President—P. S. Young, Vice-President, Public Service Electric and Gas Company, Newark, N. J.

For Vice-President—L. B. Denning, President, Lone Star Gas Co., Dallas, Texas.

For Treasurer—William J. Welsh, President and General Manager, New York and Richmond Gas Co., Staten Island, N. Y.

For Directors—Two-Year Terms:

Addison B. Day, President and General Manager, Los Angeles Gas and Electric Corp., Los Angeles, Calif.

B. J. Denman, Vice-President and General Manager, The United Light and Power Co., Chicago, Ill.

Henry L. Doherty, President, H. L. Doherty & Co., New York, N. Y.

O. H. Fogg, Vice-President, Consolidated Gas Co. of New York, New York, N. Y.

Arthur Hewitt, Vice-President and General Manager, Consumers Gas Company of Toronto, Toronto, Ontario.

William J. Welsh

N. C. McGowen, President, United Gas Public Service Co., Houston, Texas.

Wm. T. Rasch, President, American Gas Products Corp., New York, N. Y.

Thos. E. Roach, Vice-President and General Manager, Washington Gas and Electric Co., Tacoma, Wash.

W. Frank Roberts, President, Standard Gas Equipment Corp., Baltimore, Md.

Respectfully submitted,

W. B. TUTTLE, *Chairman*
WILLIAM C. BELL
H. C. BLACKWELL
H. L. DICKERSON
DONALD MCDONALD
JAMES L. STONE
Nominating Committee

The following members have been nominated by Section Nominating Committees to serve as section officers for the next Association year:

Natural Gas Department: For Chairman—John B. Tonkin, President, The Peoples Natural Gas Co., Pittsburgh, Pa.; for Vice-Chairman — William Moeller, Jr., Vice-President, Southern California Gas Company, Los Angeles, Calif.

Accounting Section: For Chairman—A. S. Corson, General Auditor, The United Gas Improvement Co., Philadelphia, Pa.; for Vice-Chairman—F. L. Griffith, Vice-President, The Peoples Gas Light and Coke Co., Chicago, Ill.

Commercial Section: For Chairman—F. M. Rosenkrans, New Business Manager, Gas Service Co., Kansas City, Mo.; for Vice-Chairman—C. E. Bennett, President, Binghamton Gas Works, Binghamton, N. Y.

Industrial Gas Section: For Chairman—J. F. Quinn, Supervisor, Industrial Gas Sales, The Brooklyn Union Gas Company, Brooklyn, N. Y.; for Vice-Chairman—C. W. Gale, Superintendent, Commercial and Industrial Gas Departments, Public Service Company of Colorado, Denver, Colo.

Manufacturers Section: For Chairman—John A. Fry, Vice-President and Secretary, Detroit-Michigan Stove Co., Detroit, Mich.; for Vice-Chairman, Apparatus Division—Merrill N. Davis, Vice-President in Charge of Sales, S. R. Dresser Manufacturing Co., Bradford, Pa.; for Vice-Chairman, Appliance Division—J. Scott Fowler, President, Lovekin Water Heater Co., Philadelphia, Pa.

Technical Section: For Chairman—C. A. Harrison, Gas Engineer, H. L. Doherty & Co., New York, N. Y.; for Vice-Chairman—F. A. Lydecker, General Superintendent of Gas Distribution, Public Service Electric & Gas Co., Newark, N. J.

Nominated for A. G. A. Directorate

Addison B. Day

B. J. Denman

Henry L. Doherty

O. H. Fogg

Arthur Hewitt

N. C. McGowen

William T. Rasch

Thomas E. Roach

W. Frank Roberts

W. J. O'Brien Heads Memphis Company

W. J. O'BRIEN was elected president and general manager of the Memphis Power & Light Company May 15 by the board of directors. Mr. O'Brien, who is succeeding the late W. D. Kyser, was formerly vice-president and general manager. A native of New Orleans and a graduate of Purdue University, Mr. O'Brien received his early experience in the public utility field with the Denver Gas & Electric Company, the Pueblo Gas & Fuel Company, the Helena Gas & Electric Company, and the Corpus Christi Railway & Light Company. Subsequently he became affiliated with the Niagara, Lockport & Ontario Power Company.

It was in 1926 that Mr. O'Brien went to Memphis as assistant to the president of the Memphis Power & Light Company and one year later he was elected to the position of vice-president and general manager.

Institution of Gas Engineers American Reunion Dinner

TO commemorate the visit of last year to Canada and the United States, simultaneous celebrations were held in London, Toronto and New York. Doubtless many a toast was also proposed for the occasion in the other cities visited in Canada and the United States.

The occasion was the annual meeting of the Institution; at the Park Lane Hotel in London sixty-nine members, wearing the same Institution name badges they used over here, sat down Wednesday, June 6, to a dinner, on the menu of which American dishes were featured.

Following the loyal toasts to The King and The President, proposed by Frank P. Tarratt, president of the Institution, chairman, a toast was drunk at 9:30 P.M. London time to "our friends of the American and Canadian Gas Associations."

In New York, President Caster and the Committee, Clifford E. Paige, chairman, with H. Leigh Whitelaw, A. J. Gonnoud, and Donald McDonald, which made the arrangements for reception of the visitors in the United States, assisted by Managing Director Forward and other friends gathered at the Engineers Club.

Precisely at 4:30 P.M. Eastern Daylight Saving Time (9:30 P.M. British Summer Time) President Caster called on all present to stand and drink a toast to those gathered together in London. Cablegrams were exchanged and read at the meetings, and so the sincere spirit of friendship was further strengthened.

H. A. Ehrmann Takes Post in East

TRANSFERRING the scene of his activities from the Middle West to the East, Herbert A. Ehrmann, widely known in American Gas Association circles, became affiliated with Consolidated Gas Company of New York on July 1, 1934.

Mr. Ehrmann brings to his new work more than a quarter century of varied experience in public utility work. He started with The Peoples Gas Light and Coke Company of Chicago in 1907. Fifteen years later he became assistant comptroller and then treasurer of the Midland United Company and Midland Utilities Company, two investment organizations controlling utility companies supplying over 800 communities in Indiana, Ohio, Michigan and Illinois, with gas, electric, water, heat, ice, motor coach or railway services. He held the post of treasurer of the West Ohio Gas Co. and the Chicago South Shore and South Bend Railroad.

While with the Midland group, he was instrumental in initiation of procedures involving management policies and accounting control.

High spots of his Association work include the chairmanship of the committee that worked up the alphabetical and classified list of office equipment machine manufacturers. He is also active in various phases of accounting section work.

Mr. Ehrmann received his education in Chicago grammar and high schools, and also at the Northwestern University School of Commerce.

Importance of Research in Development Of A.G.A. Standards

By F. O. SUFFRON
Research Engineer A.G.A. Testing Laboratory

IN general, very little thought is given to the essential part scientific research has played in providing the numerous mechanical servants that have contributed so much to the well-being and comfort of the American people. The average person is apt to accept the manifold developments of this modern age with little, if any, conscious realization of the important role that painstaking and intelligent investigational work has occupied in these achievements. Even the most complex of mechanisms are utilized in a matter-of-fact manner, largely because they are so well designed and constructed, as a result of comprehensive research and sound engineering, that their operation requires little or no effort and, as a consequence, their usage frequently becomes a habit.

It is not surprising, therefore, that the domestic appliance and accessory products of our own industry, while enjoying a very satisfactory consumer acceptance, arouse no particular appreciation on the part of the public as to the enormous amount of technical and manufacturing ingenuity that they represent. In fact, many who are actively engaged in the gas industry are not fully cognizant of these interesting and essential components of one of the nation's largest enterprises.

It is general knowledge that many utilities and gas appliance manufacturers maintain laboratories for investigational purposes, leading to more convenient and economical utilization of gas. The activities of the American Gas Association's Testing Laboratory in testing and inspecting gas appliances and accessories, and granting official recognition thereto, are also familiar to many. This cooperative endeavor of gas companies and appliance manufacturers has, indeed, received world-wide recognition. However, little is known of the technical and administrative background of these activities.

For example, approval and listing requirements governing the performance and construction of nearly 32 distinct and separate gas appliances and accessories have been developed by committees of the American Gas Association in cooperation with the Association's Laboratory. In addition, there have been published two sets of installation requirements. The preparation of each of these standards has been supervised by the A. G. A. Approval Requirements Committee which also functions as a sectional committee of the American Standards Association (Project Z21), and includes representatives from many governmental bureaus, trade associations, scientific organizations, home economics groups, as well as many other national organizations having a direct or indirect interest in the products of the gas industry.

The technical development of these specifications rests largely with the 22 subcommittees of the Approval Requirements Committee, each of which is responsible for the preparation of requirements for a separate type of appliance or accessory. The membership of these subcommittees represents approximately 200 gas company and manufacturing representatives who are eminently qualified for this standardization work. The specifications prepared under this committee procedure are the only recognized standards for the construction, performance, and installation of gas burning appliances and their accessories, as evidenced by the fact that 17 complete and distinct sets of such specifications are now approved as American Standard, while others will undoubtedly receive similar recognition in the near future.

A vast amount of deliberation and study is involved in the formulation of these nationally accepted standards on which are premised the Association's appliance and accessory testing and certification programs. Whereas many of the specifications included in these standards require only limited study or investigation, in nearly all instances the Testing Laboratory staff prepares the initial drafts for the committees' consideration, and in most cases checks them against a number of representative types of appliances or accessories to which they apply in

Loads of various magnitude applied to gas range parts to determine their ability to resist stresses

One of the set-ups used in studying various methods of determining floor furnace efficiencies

order to determine their applicability.

A majority of the various construction and performance requirements, however, are of such a nature that suitable investigational work on which the committees may base equitable requirements is necessitated. This investigational work is generally assigned to the Testing Laboratory where the required experimental data is collected. After completion of a project a report of the findings, together with pertinent recommendations and suggested requirements are presented to the committee which originally assigned the problem to the Laboratory for study. From this authoritative information the committee is enabled to prepare requirements relating to the phase of appliance performance or construction under consideration with a degree of certainty as to their equity and justification which, in the absence of such research data, would be impossible.

The character and extent of the problems investigated by the Laboratory each year, in order that the preparation and revision of requirements may be kept apace with the rapid developments in the industry, are far more extensive than generally believed. This research is of a most varied character due to the large number of different appliances and accessories involved, and the scope of each set of standards. In solving the various problems assigned to the Laboratory an intimate knowledge of many branches of the engineering profession is required.

For example, during the past fiscal year of the Association, requirements research investigations have included such items as studies of the corrosion of semi-rigid tubing and fittings, the deflection of gas range structures under vertical and torsional loads, the operational characteristics of thermostatic pilots under test conditions simulating years of actual usage. The extent of the projects conducted may best be illustrated by statistics of the requirements research activities during the fiscal year ending last fall. For that period 40 projects were completed and the reports to the various committees covering this work totaled 862 pages. These figures gain more significance when the general economic conditions prevailing during that period are considered.

One factor usually present in requirements research and which adds considerably to the cost of this work is that the standards established are minimum requirements and must, therefore, reflect the performance or constructional characteristics of a representative number of appliances or accessories of the type under consideration. Obviously, adoption and enforcement of specifications, which are beyond the abilities of a majority of the appliances to meet, would be an untenable and discriminatory procedure.

The ramifications of this policy are well demonstrated by the investigational work conducted on insulated ovens of gas ranges. For several years an equitable test, whereby a satisfactory insulated oven could be differentiated from the non-insulated type, was sought by the gas range subcommittee. Several preliminary projects which had been initiated at the request of this committee were found to be unsuitable in one respect or another. Finally, the Laboratory devised a precise means of measuring surface temperatures and a technique of applying such means to the purpose at hand. Incidentally, the basis for selecting oven surface temperature as the criterion of effectiveness of insulation was the fact that a majority of the members of the Home Service Committee of the A. G. A. who were contacted by the Laboratory felt that the average consumer considered cool oven exteriors to be one of the most desirable of all insulated oven characteristics.

The gas range committee believed this method to be acceptable, but felt that a number of ranges should be studied before oven surface temperature limits that were compatible with present-day development could be selected. The Testing Laboratory, therefore, secured and conducted exhaustive tests on 15 modern gas ranges, this work being presented to the gas range requirements committee

Tests on Thermostatic pilots accelerated to simulate years of normal usage

The performance of many types of draft hoods were thoroughly studied before a set of requirements was proposed

in two reports totalling nearly 60 pages. A requirement based on this research is now a part of the American Standard Approval Requirements for Gas Ranges, and is the means whereby an insulated oven range is insured of possessing satisfactory characteristics from the consumer's viewpoint.

In most cases it is necessary for the approval requirements committees and the Testing Laboratory to evolve complete sets of standards relating to appliances or accessories for which no suitable performance or constructional specifications have previously existed. In such instances, it is essential that a representative number of appliances or accessories be subjected by the Laboratory to comprehensive investigations covering every constructional and performance feature that might possibly affect their continued safe, reliable, and efficient operation.

An excellent example of this type of pioneering work may be found in the investigations of gas appliance accessories leading to the development of listing requirements for such devices. These projects were inaugurated early in 1932 and prior to that time not only were the references to accessories in the approval requirements very brief, but nowhere else could be found any authoritative specifications relating to these devices. The problem was, therefore, one of establishing a large number of test procedures as well as collecting original data of a very voluminous character.

The magnitude of this enterprise can well be imagined when it is considered that large numbers of each of the following types of accessories were subjected to exhaustive study. Conversion burners, draft hoods, gas burner valves, thermostats, domestic gas pressure regulators, thermostatic pilots, gas shut-off valves, electric gas-control valves, diaphragm gas valves, semi-rigid gas tubing and fittings, and pressure, temperature, and vacuum relief devices.

The performance and construction of 60 thermostats were thoroughly investigated and the report covering this project, which was presented to the committee preparing the thermostat listing requirements, comprised 102 pages. Similarly the report concerning relief devices involved 71 such devices and contained 92 pages. The standards for all of these various accessories have either been completed or are in the final stages of preparation. Thus, a new era is marked in the operations of the Laboratory and an achievement of which the industry can well be proud of has been attained.

It might be supposed that when suitable requirements have been drafted for all types of gas-burning appliances and their accessories, the need for research would become considerably less. However, this has not proven to be the case. Even during the last two years when the entire field of domestic appliance accessories was thoroughly probed, the research activities in connection with revision of standards already established exceeded the expenditures necessitated by the accessory investigations. It is reasonable to expect, furthermore, that as the number of requirements increases, the need for research leading to revision of such standards will also increase.

The extent to which it has been necessary to revise requirements, in order that they may be kept abreast of appliance development, is well demonstrated by the gas range standards. These standards when published in 1928 contained 165 distinct specifications. The current requirements for ranges (1934) contain 332 separate requirements. Furthermore, only approximately 100 of the 165 provisions appearing in the 1928 requirements have been carried unchanged into the present edition. The large volume of research required preliminary to these changes can be easily visualized.

A field for requirements research which did not exist a year ago has been opened by the development of the listing standards. The Approval Requirements Committee has ruled that such standards should be correlated to the fullest possible extent with the approval requirements for appliances. A large volume of investigational work has been necessitated by the correlation of these two types of requirements, since appliance subcommittees are generally unwilling to accept proposals based on listing specifications, until it is demonstrated that such proposals will be adequate and not unduly severe when applied to appliance performance and construction. Since these activities must be continued until complete conformity of all requirements is attained, the demand for investigations of this nature will probably be continued if not actually increased in the future.

It is noteworthy that the results of certain research projects lead to deletion of some existing requirements. It is the policy of the Approval Requirements Committee and, accordingly, of its various subcommittees, to substitute, wherever possible, performance requirements for constructional specifications which are inherently more restrictive than the former. Consequently, in many instances a performance standard, devised as a result of intensive study, has replaced two or more requirements limiting in some respect or another the type of construction considered acceptable. Research

(Continued on page 264)

Convention Calendar

SEPTEMBER

1- 4 **International Gas Union**
Zurich, Switzerland

9 **American Trade Association Executives**
Wernersville, Pa.

11-13 **Pacific Coast Gas Association**
Del Monte Hotel, Del Monte, Calif.

24-28 **American Transit Association**
Cleveland Public Auditorium, Cleveland, Ohio

24-26 **British Commercial Gas Association**
Sheffield, England

OCTOBER

14-19 **American Dietetics Association**
Mayflower Hotel, Washington, D. C.

Wk. 29 **American Gas Association Convention and Exhibition**
Atlantic City, N. J.

NOVEMBER

12-15 **National Assn. Railroad & Utilities Commissioners**
Washington, D. C.

Pennsylvania Natural Gas Men's New Head

G. W. HARR, manager of the gas department, Monongahela-West Penn Public Service Company, Fairmont, West Virginia, was elected president of the Pennsylvania Natural Gas Men's Association at a recent meeting of directors. Mr. Harr succeeded F. F. Schauer, of Pittsburgh. Other officers of the association are H. H. Phillips, Butler, Pa., vice-president, and B. H. Smyers, Jr., Pittsburgh, secretary-treasurer.

G. W. Harr

Midwest Council

THE next regular meeting of the Midwest Industrial Gas Sales Council will be held at the Palmer House, Chicago, September 21. The main topic for discussion will be "Gas and Its Competitive Fuels," led by C. H. Lekberg, of the Northern Indiana Public Service Co. Mr. Lekberg is chairman of the Competitive Fuels Committee of the Midwest Council.

Associations Affiliated With A. G. A.

Canadian Gas Association
Pres.—J. Chesley Dawson, Quebec Power Co., Quebec, Canada.
Sec.-Tr.—G. W. Allen, 21 Astley Avenue, Toronto.

Empire State Gas and Electric Association
Pres.—Alfred H. Schoellkopf, Niagara Hudson Power Corp., Buffalo, N. Y.
Chairman, Gas Section—A. M. Beebee, Rochester Gas & Electric Corp., Rochester, N. Y.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.

Illinois Public Utilities Association
Pres.—Bernard J. Mullaney, The Peoples Gas Light & Coke Company, Chicago, Ill.
Sec.—J. R. Blackhall, Suite 1213, 79 West Monroe St., Chicago, Ill.

Indiana Gas Association
Pres.—R. S. Brunner, Indiana Gas Utilities Co., Richmond, Ind.
Sec.-Tr.—P. A. McLeod, New Castle, Ind.

Michigan Gas Association
Pres.—D. W. Hayes, The Detroit Edison Co., Port Huron, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.

Maryland Utilities Association
Pres.—W. A. Tobias, Hagerstown Light & Heat Co., Hagerstown, Md.
Sec.—C. R. Burger, 26 South Jonathan St., Hagerstown, Md.

Mid-West Gas Association
Pres.—C. T. Williams, Sioux City Gas & Electric Co., Sioux City, Iowa.
Sec.-Tr.—Roy B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa.

Missouri Association of Public Utilities
Pres.—Fred Karr, St. Joseph Gas Co., St. Joseph, Mo.
Sec.-Tr.—N. R. Beagle, Missouri Power & Light Co., Jefferson City, Mo.
Asst. Sec.—Jesse Blythe, 103 West High St., Jefferson City, Mo.

New England Gas Association
Pres.—F. M. Goodwin, Boston Consolidated Gas Co., Boston, Mass.
Exec. Sec.—Clark Belden, 41 Mt. Vernon St., Boston, Mass.

New Jersey Gas Association
Pres.—E. J. Menerey, Peoples Gas Co., Glassboro, N. J.
Sec.-Tr.—G. B. Webber, Public Service Electric and Gas Co., Newark, N. J.

Ohio Gas and Oil Men's Association
Pres.—L. K. Langdon, Union Gas & Electric Co., Cincinnati, Ohio.
Sec.-Tr.—Wm. H. Thompson, 811 First National Bank Bldg., Columbus, Ohio.

Oklahoma Utilities Association
Pres.—H. B. Cobban, Northeast Oklahoma Railroad Co., Miami, Okla.
Mgr.—E. F. McKay, 1020 Petroleum Bldg., Oklahoma City, Okla.

Pacific Coast Gas Association
Pres.—Geo. P. Egleston, H. R. Basford Co., San Francisco, Calif.
Mang. Dir.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.

Pennsylvania Gas Association
Pres.—T. W. McDonald, Pennsylvania Gas & Electric Co., York, Pa.
Sec.—Frank W. Lesley, Pennsylvania Gas & Electric Co., York, Pa.

Pennsylvania Natural Gas Men's Association
Pres.—G. W. Harr, Monongahela-West Penn Public Service Co., Fairmont, W. Va.
Sec.-Tr.—B. H. Smyers, Jr., 435 Sixth Ave., Pittsburgh, Pa.

Southern Gas Association
Pres.—W. W. Winter, Atlanta Gas Light Co., Atlanta, Ga.
Sec.-Tr.—S. L. Drumm, New Orleans Public Service Inc., New Orleans, La.

The Public Utilities Association of Virginia
Pres.—T. Justin Moore, Va. Elec. & Power Co., Richmond, Va.

Wisconsin Utilities Association
Pres.—G. V. Rork, Northern States Power Co., Eau Claire, Wis.
Exec.-Sec.—A. F. Herwig, 135 West Wells St., Milwaukee, Wis.

Philadelphia Cooking School Wins Polish Housewives

Typical audience at Philadelphia's Polish Food Show and Cooking School

THROUGH the cooperative efforts of the Philadelphia Gas Works Company, The "Gwiazda," a weekly Polish language newspaper, and the Richmond Stores Association—one of the largest chain grocery organizations in the East—nearly 10,000 Philadelphia home makers, principally of Polish descent, have gained a better appreciation of the advantages of cooking with gas and hence, become better and thriftier cooks.

Cooking schools are by no means a novelty—even to the foreign-born housewives of Philadelphia. But when you feature a program given in the native tongue of the majority of your audience with recipes especially adapted to the customs of their homeland—and throw in an exhibition of food products sold in their neighborhood stores you have indeed started something.

The Great Northeast Food Show and Cooking School which played to a house of nearly 70,000 in its six-day stand in the Lithuanian Music Hall is believed to have been the largest exhibition of its kind—barring the Annual Food Fair held in Convention Hall—ever promoted in the City of Philadelphia.

Special menus and recipes embodying many popular Polish dishes were prepared for the school by Miss Beatrice Cole Wagner, home service director of the gas company, in collaboration with the newspaper. Copies of these meal suggestions with a different offering for each of the six classes were printed both in Polish and English and distributed among the audience together with charts—also printed in Polish—explaining the use of the oven heat regulator and time control and giving the proper time and temperature for many cooking operations.

The lectures and demonstrations were conducted by Miss Wagner and her assistants, with a representative of the "Gwiazda," acting as Polish interpreter.

The demonstrations were staged in a modern kitchen setting and both sides of the auditorium were lined with attractive displays of the newest type gas ranges, refrigerators and water heaters. At the close of the cooking school each day, the audience was invited to inspect the various appliances on display, and as a result, several sales were immediately closed and a large number of promising prospects were developed.

Outside the hall, the gas company's kitchen demonstration coach also attracted great attention. All attendance records for the coach were broken when approximately 1,650 persons passed through its doors in less than three hours.

IMPORTANCE OF RESEARCH IN DEVELOPMENT OF A.G.A. STANDARDS

(Continued from page 262)

of this type is exceedingly valuable to the industry in that it ultimately permits the appliance or accessory manufacturer to exercise the utmost ingenuity in fabrication and design.

Only by removing all restrictive constructional specifications wherever possible and establishing performance characteristics as the sole criteria of the suitability of appliances and accessories can the interests of the public and our industry best be served. Although a large number of projects of this nature have been completed and are in process, there remains a considerable amount of work to be done in this field.

In addition to collecting experimental data and preparing reports for the approval requirements committees, the requirements research activities include many other collateral factors. Practically all agenda for the various requirements committees is prepared by the Laboratory under the supervision of the committee chairman. During the Association's fiscal year ending last fall, nearly 1,000 pages of mimeographed material, exclusive of research reports, were prepared for the 27 committee meetings held during that period. Laboratory representatives attend each of these meetings in an advisory capacity and for the purpose of recording committee action. The minutes of the various meetings, together with appendices containing revisions effected in the requirements, comprised nearly 500 pages during the above mentioned period, and distribution to committee members required thousands of copies.

Complete records of requirements in process are maintained at the Laboratory. When the occasion requires these requirements are correlated and an initial or revised edition of the standards published. During the year 1932-1933, 22 sets of requirements totalling 38,000 copies were printed by the Laboratory. Coupled with the above are the details of organization of new committees, revisions in lists of committee personnel from time to time as circumstances require, and the arrangements for committee meetings, all of which is necessarily included as a part of the requirements research program.

It is apparent that activities of this nature require a considerable amount of detail work for the proper correlation of the items enumerated. The correspondence attendant to requirements research work, committee activities, and requirements publication is almost limitless. The Laboratory also acts as a correlating agent between the various committees, and between these committees and interested outside organizations such as the American Standards Association and the National Bureau of Standards.

The requirements research conducted by the Testing Laboratory is of course an integral part of its extensive operations. The value of this work to the industry and the public as a whole cannot, therefore, be isolated and evaluated. It follows, however, that the distinct contribution which the Laboratory operations are generally recognized as having made is attributable in no small measure to this requirements research program.

Motion in Industrial Window Displays

Revolving window display at Rockford, Ill.

IN the last year or two there have been some excellent examples of industrial window displays produced by various gas companies in different parts of the United States. These displays are almost universally stationary, due principally to the technical difficulties in introducing motion in such displays. There is also the element of additional cost in making a suitable industrial window display which includes the element of motion.

However, the value of having some sort of movement in a window from the standpoint of attracting additional attention is considered to be of value and there has been some study given to possibilities of having some motion as a feature of such displays.

J. H. Erwin, gas superintendent, Central Illinois Electric and Gas Company, has developed an industrial window display recently which introduces this idea of motion. This display appeared in one of the windows of the above company in Rockford, Illinois. The theme of the window was the use of industrial gas and the cooperation between the gas company and the various manufacturers. The background of the window carried the slogan, "Gas for Every Industrial Use" and "These Rockford Manufacturers Believe in Gas."

The center table was so arranged that it revolved slowly and on each one of the twelve sections was displayed the products of one of their local industrial gas customers. These products covered a very wide range and represented a wide variety of uses for industrial gas.

Chappel Brothers, Inc. displayed Ken-L-Ration and other products; the Washburn Company displayed kitchenware which was tinned in their plant by the use of gas; National Lock Company displayed hardware which was processed by using gas and included in this display was a complete set of hardware such as is used on the new model Electrolux Refrigerator; Barber-Colman Company displayed various tools, thermostats and valves; Rockford Sheets Silver Company displayed a tea set. In addition to these manufacturers were included several other tool companies, several bakeries, and Geo. D. Roper Corporation, manufacturers of gas stoves. In the background of the window were displayed industrial furnaces, one furnace being furnished by the American Gas Furnace Company, locally distributed by O. T. Muehlemeyer. The other furnace was supplied by the Eclipse Fuel Engineering Company whose manufacturing plant is located in Rockford.

Scattered on the floor of the widnow, were various types of industrial burners each described by suitable cards. In the center of the revolving table, the word "GAS" was spelled in large letters painted on the sides of brightly colored cubes. The window attracted a great deal of attention both because of the variety of products displayed and because of the motion of the center table. This display received favorable comment both from the cooperating manufacturers and from the public.

Sales Are Doubled By Electrolux

ELECTROLUX Refrigerator Sales, Inc., sold twice as many gas refrigerators during the six-month period ending on June 30, 1934, as in the similar period of 1933, according to F. E. Sellman, vice-president of the company.

"Sales of Electrolux air-cooled gas refrigerators for the first six months of the present year not only double those of the first half of last year," Mr. Sellman said, "but these sales are an all-time record for any six months in the history of the company. This record is a clear indication of the growing acceptance of gas refrigeration on the part of the public. The sales were made in practically all sections of the country."

Commonwealth & Southern Acquires Gas Properties

REPORTS were confirmed last month by Wendell L. Willkie, president of The Commonwealth & Southern Corporation, that its South Carolina operating unit, the South Carolina Power Company, has acquired the gas property in Charleston, and that its Florida operating unit, The Gulf Power Company, has acquired the gas property in Pensacola, and that its Michigan operating unit, The Consumers Power Company, has acquired certain gas and electric properties in that State formerly owned by Michigan Federated Utilities and Lower Peninsula Power Company.

Gas Stove in Use 44 Years Cooked 231,000 Meals

A GAS stove used every day for the past forty-four years, cooking 231,000 meals at a cost of a half a cent per meal per person, with only 75 cents spent for mechanical repairs in the nearly half a century, has just been located in Nashville, Tenn.

The owner is Mrs. Louis Gibel, 1301 Eastland Avenue, and the stove she bought in 1890 is still in active use in her kitchen. She refuses to use any fuel except gas.

As a reward for her unique record Mrs. Gibel was given a new gas stove by the Nashville Gas and Heating Company, whose officials located Mrs. Gibel through a contest.

Allowances of $25 and $15 were made to owners of gas ranges that were second and third oldest in Nashville.

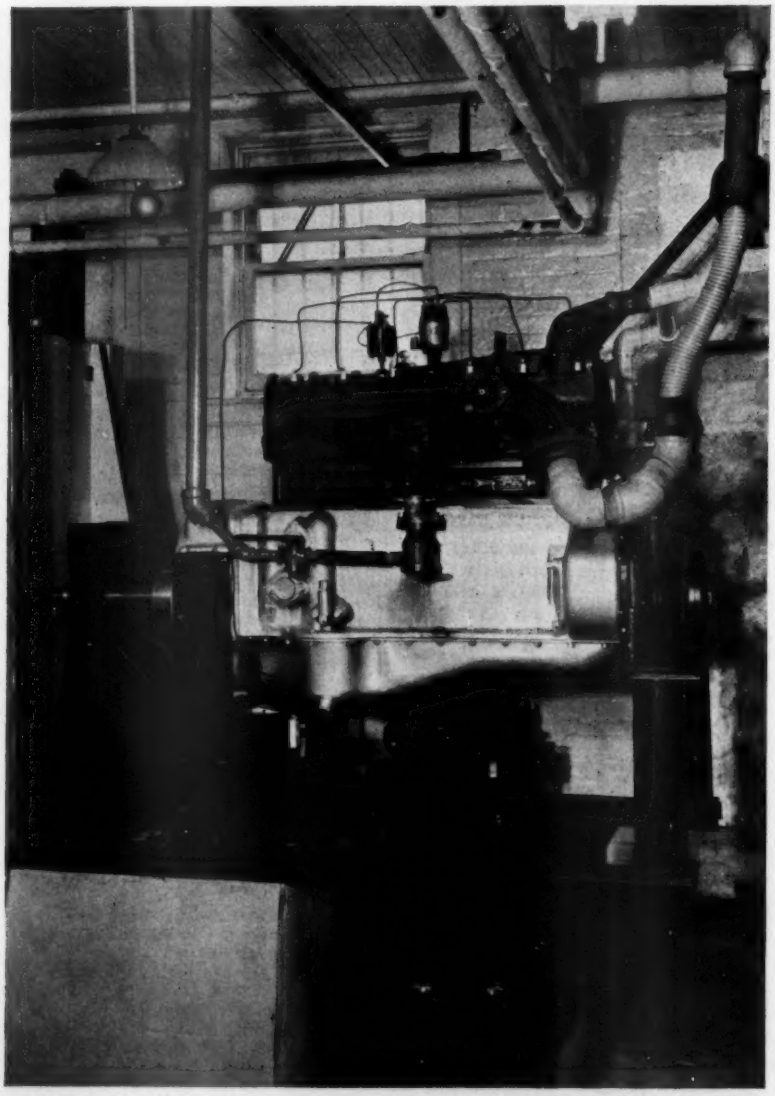
More than 300 gas range owners of Nashville entered the contest, with the average age of the stove being twenty-seven years, the average cost of repairs less than a dollar, and the average cost per meal per person less than one cent, according to statements of the owners.

The stove owned by Mrs. Gibel was displayed in the show windows of the gas company.

Activity in Gas Engineering At Brooklyn Polytechnic

THE school year, which ended in June, was one of considerable activity in the field of gas engineering at the Polytechnic Institute of Brooklyn, Brooklyn, N. Y. In addition to the successful completion of the course in Gas Engineering by thirty-four members of the class which began in September, 1933, several investigations on timely topics related to gas utilization were offered as theses by graduating students in the regular four-year engineering course.

A very interesting and complete study of the operating characteristics of a summer air-conditioning system employing a rotating silica gel bed as the dehydrating medium was made by Howard E. Holtz '34 as his thesis for graduation: The data upon which the conclusions of this research were based were taken over a test period of forty-eight days during the summer of 1933. The unit was in actual service during the time it was being tested and therefore the data embodies all the variables encountered in operation. Tests were conducted at various loads on the system and with different conditions of operation of the silica gel cycle of adsorption and re-activation. The author of this thesis summed up his findings with an interesting analysis of the operating costs as well as a heat balance for the system. In carrying on this project the student had the valuable cooperation of the Brooklyn Union Gas Company in whose territory the air conditioning unit is located.



Gasoline engine, converted to use gas as fuel, which drives propeller of wind tunnel at Polytechnic Institute of Brooklyn.

Another topic of interest also presented as a thesis is entitled "Development of Submerged Combustion Burners for Gas." This work had as its object the development of submerged combustion equipment of simple design and control. The author, Charles I. Burns '34, was successful in constructing a burner which was satisfactory with respect to completeness of combustion and the elimination of noise. Some of the earlier designs were particularly objectionable because of the noise they produced. This investigation was conducted using a combustion system providing a low pressure mixture at the burner and consequently it was possible to submerge the burner only about ten inches and have combustion maintained. It is expected to continue this investigation using higher pressures in order to submerge the burners to a greater depth and also to study the efficiencies obtainable in the process of evaporation under pressure, as the results of this first test are promising.

A third investigation, the latest of a series dealing with the performance of industrial atmospheric burner equipment, is called the "Study of the Effect of Port Proportions and Venturi Position on Air Entrainment." This study had as its first purpose, as its title implies, the determination of the variation in air entrainment as effected by the number of ports used to obtain a given port area. The method employed in the tests was to construct several pipe burners of the same dimensions each providing one square inch of port area but with the number of ports varying from 128 to a single port. With each of these burners attached in turn to the same venturi, the ratio of primary air to gas over the complete range of "turndown" was studied and curves of the burner performance plotted. In the latter portion of this investigation the author of this thesis, Mark Kogan '34, devoted his attention to studying the effect on air entrainment capacity of changing the venturi position from vertically upward through 180° until it pointed vertically downward. The resulting data is interesting and consistent and shows a variation of ratio of primary air to gas of 10 per cent over this range of positions.

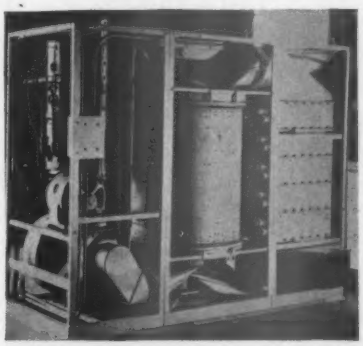
These investigations as well as several others dealing with problems of gas utilization submitted in previous years were conducted under the direction of J. A. Lambertine of the Institute staff.

(Continued on page 271)

Bryant Acquires Silica Gel and Patents For Gas Air Conditioning

THE Bryant Heater Company, Cleveland, Ohio, largest merchandising organization in the gas house heating and air conditioning field, announced last month that it has acquired exclusive rights to Silica Gel and all Silica Gel equipment patents for comfort air conditioning.

This step is the result of extensive research and analysis of air conditioning needs and requirements which have disclosed the fact that if it is practical and economical to remove the excess moisture from air, then only a small reduction in dry bulb temperature is necessary to give the proper feeling of comfort. Further, that air conditioned in this manner avoids the sensation of chill or dampness that often otherwise prevails in the space involved. In other words, satisfactory comfort air conditioning means more emphasis on humidity control and less on temperature control. This research and development have been carried on under the sponsorship of the Committee on Industrial Gas Research of the American Gas Association.



Bryant-Silica Gel Gas Operated summer air conditioner, designed for use in connection with central warm air heating plants

The dehumidification of air which this principle involves has been practically and satisfactorily solved in many fields by the application of the "dehydrating" quality of Silica Gel. Over a period of years, Silica Gel equipment has been developed and successfully operated in a wide range of industries where it was necessary to reduce the moisture content of the air,—either where the air was used for process purposes, or where certain operations were performed under a controlled atmosphere condition.

Gas-operated unit summer air conditioner for single rooms

This Jamaica, L. I., restaurant is air-conditioned in the summer with gas

Successful, also, have been a number of Silica Gel installations of air conditioning systems in office and public buildings, restaurants, homes, etc., where the primary purpose was to insure the comfort and health of the occupants.

The Bryant Heater Company, in purchasing the Silica Gel process, acted on the conviction that it represents the farthest step forward in the practical and direct means of dehumidifying air for summer air conditioning and opens up the greatest possibilities for the development of summer air conditioning equipment and methods.

The above principle has been incorporated in air conditioning equipment which includes both room cabinet units as well as central plants. These will be popularly priced and with the low operating cost which the use of gas affords, the purchaser is assured of most satisfactory and practical air conditioning systems.

With this process the gas industry can make another step forward in establishing the stability of its gas load. A definite place is offered the gas industry in summer air conditioning and with it a consequent summer gas load.

New Jersey Association Exhibit

View of gas appliance equipment at New Jersey hotel show

AN impressive display of modern gas appliances was the result of a co-operative exhibit sponsored by the New Jersey Gas Association in conjunction with gas company and manufacturing company members at the sixteenth annual spring exposition of the New Jersey Hotel Association, held at the Ambassador Hotel, Atlantic City, in May.

Those participating in the displays were the Atlantic City Gas Company, Standard Gas and Equipment Corporation, Detroit-Michigan Stove Company and the Roberts & Mander Stove Company. Smaller appliances were displayed by the Homestead Heater Co., and the Radiantlog Corporation.

Sales Experiences

Compiled by Sales Experience Committee, Industrial Gas Section

IN every city there are one or more men who, taken as a whole, form one of the most unique guilds of workers in any industry.

Engineers they are. Salesmen they must be. Important public relations are frequently entrusted to them. Contacts they must always maintain and service in its true sense they must be always ready to maintain.

They know what is going on in every factory, mill, shop, restaurant kitchen and hotel kitchen throughout the land. They know how the clothes we wear are made, how automobiles are produced, how coffee is roasted to give it the finest aroma. They help manufacture the thousands of articles that fill our great department stores or fill the holds of ships that carry our exports to the far corners of the earth.

They meet the owners of small shops at their benches and talk their language. But they also deal with the largest plants in the country, the names of which are household words.

They must know how to inspire the workman and they must make friends with captains of industry and with well-known and sometimes temperamental chefs.

They participate in conferences where industrial history is being made. But they must ever be prepared to roll up their sleeves and help an ailing plant out of trouble that frequently they are not responsible for.

When depressions come it is they who feel them first, feel them in the fierce competition of competitive services, feel them in lowered industrial activity and in plants shut down. And when better times begin to dawn they must be sure that the service they represent has been completely adjusted to meet the needs of newer methods, newer products and speedier production.

Romance? They live it. They create it, because they are continually behind the scenes in the biggest industrial romance this world has ever seen.

They are backed by advertising, by research, by good management, but in the workshops of the nation they are the gas company—yes, the gas industry.

Who are they? You know them. You see them every day. They are your Industrial Gas Men.

Blades from Gas Cutting Blades of Grass

There are a lot of lawn mowers used in this country, and what with shorter hours and Saturday holidays suburbanites are getting wise to a lot of things concerning them that they did not know before. One thing they have found out is that a lawn mower is no better than the blades. Doll them up as much as you care to and print a pretty catalogue, but it's the blade that cuts the grass.

At Bloomfield, N. J., the Townsend Lawn Mower Company determined to make the spare time of home owners easier by making better lawn mowers. They concentrated on the blades. Blades used to have hard and soft spots and that caused a lot of trouble out on the lawns, especially the rough ones. The trouble was traced to the heat treating department where oil was used in rather poorly constructed furnaces.

With the help of W. F. Wright, local industrial fuel representative of The Public Service Electric & Gas Company, a 1,000 cu.ft. an hour direct-fired oven furnace using Surface Combustion Low Pressure Tunnel Burners was installed to heat treat the blades. It was decided to remodel the factory layout to get better working conditions and the cost of installing the gas furnace under the new layout was considerably less than would have been the cost of building new oil furnaces, installing oil tanks in new location, etc.

Well, to make a long story short, there are no more hard or soft spots in the blades and the lawns are smoother. The investment was kept down and 90 cent gas has definitely licked 7 cent oil. The connected load is 1,000 cu.ft. an hour.

Step on the Gas!

Score one for the six cylinder engine. This time it's a Studebaker. After driving a sedan about fifty thousand or more miles, there was still life in the old "injin." So it was taken from the car and hooked up to a large refrigerating machine in a grocery store and has now entered its second childhood. But no more carburettor, no more gasoline tank, no more running out of gas. This engine has for a year been living on natural gas and likes it.

E. J. Hatzenbuehler, Industrial Gas Engineer of the Lone Star Gas Company, arranged for moving the engine from the Studebaker to the grocery store. Says he, "No repairs, no breakdowns during a year's operation, and the engine runs steadily at the speed it used to run when pulling the Stude fifteen miles an hour down the road. But here's what the present owner likes. Only $20 a month for gas and lubricating oil. How does that sound compared to the $70 the grocer used to pay out every month for running his 4" x 4" ammonia compressor with purchased power at 4¢ a K.W.H.?"

This gas engine is installed in the Ransome Grocery Company, Corsicana, Texas, where natural gas sells for 67½¢ per thousand cu.ft.

A Yarn About Cotton Yarn

Way down South 't is said that Cotton is King. In New Bedford, Mass., gas is its Queen and together they make a royal pair. Cotton cloth or cotton yarn would not look like much if it wasn't singed during the making. The Kilburn Mill makes its own electricity and used to singe its yarn with kilowatts. But Johnny Kilowatt went marching home to keep from getting gassed one day and home he has been ever since. He couldn't stand the pace. Cost had nothing to do with it, he just couldn't stand the pace.

The reason for this was pointed out by Stuart F. Morgan, superintendent of utilization of the New Bedford Gas & Edison Light Company. He declared that the steady controllable sheet of fire from gas flames does a singeing job that was heretofore unknown in this mill. To slow rates of operation as well as sudden changes to the prodigious speeds of modern production, gas fits itself, and the mill owners are very well satisfied.

The 85¢ gas is proportioned and mixed in a low pressure system.

A Battle Over Costs

One cent electricity is pretty cheap current and The Eaton Detroit Metal Products Co. of Cleveland, Ohio, thought they were keeping costs down when they equipped their conveyor oven to use this cheap juice. The oven worked all right and did a good job at drying metal stampings after they were rinsed, but that factory is supplied with another source of energy that for cheapness has knocked electricity into a cocked hat.

Fifty-five cents natural gas is now heating that continuous drying oven, thanks to efforts of A. T. Code of The East Ohio Gas Company. Mr. Code equipped the apparatus with a North American proportional mixing system and specially designed ribbon burners for scientifically distributing the heat. Two hundred cubic feet of gas an hour effect a very substantial saving.

Why the Dollbabys are Smiling

There's something about this city gas that clicks. In Trenton, N. J., a large manufacturer of dolls has fifty-nine pressers for forming the various parts of the dollish anatomy and they were all heated with butane. Things were not working right, however, and C. Lester Bensel, industrial gas expert of The Public Service Electric & Gas Company, was called in, possibly because in his younger days he had been a model and has not yet lost that John Barrymore countenance, so dear to the designers of dolls. It didn't take him long to see that for press heating work combustion requirements are about as severe as they are anywhere. That is, combustion must be perfect under the exacting conditions demanded.

The factory people had done everything in their power to adjust things so that the heat would be there as needed, and so had the butane people, but it would not stay put.

Mr. Bensel was convinced that city gas could be made to burn under the confined conditions in the presses, provided proper proportional mixing and burner location were applied. He specified a Kemp Industrial Gas Carburettor with suitable accessories and secured the order to make the change to city gas.

The change was made and it was found that proper combustion was attainable and that the presses were kept at just the right temperature. There are no interruptions to production now and the doll company has found that the cost of using city gas is less than their costs were when they used butane.

Where Competition Hasn't a Chinaman's Chance

B. T. Poor is industrial service engineer of the Fall River, Mass., Gas Works Company. And besides, he likes chow mein and noodle soup. In his town is a plant that makes egg noodles of the kind that Chinamen use to make good chow mein, and others use to make soup. Mr. Poor agreed with the owner of the plant that good noodles must be well made, particularly well steamed. He assisted in making a specially designed steaming cabinet which would insure that each strand of noodle would have the proper texture, so that those who like to hold this delicacy above their mouths could do so without fear that they would break, as that would cause considerable embarrassment.

This noodle cabinet gets its steam from a cast iron gas boiler of the house heating variety, and its cost 0.25 mills a pound to do the steaming with 80¢ gas. Mr. Poor is still trying to figure out how many miles of noodles they can make each year.

How Valuable is Hot Air?

Well, at one plant in Cleveland, Ohio, it's pretty valuable. A. T. Code, assistant manager of the Industrial Department of the East Ohio Gas Company, tells something of how wire is baked at the factory of the National Screw & Manufacturing Company. It seems as though electricity used to heat the ovens in which the wire is baked. Rather it roasted the wire which was not so good for the wire. And it cost too much which was not so good for the firm's pocketbook.

So convected gas heat was brought into the picture. Now, scientists and research men have always pointed out that convected heat will bake better than radiated heat. Furthermore, convected heat is a natural for gas while radiated heat has somewhat the same relationship to electricity. These properties showed up in this instance and operating costs were cut 80%, yes 80%; heating was speeded up and the uniformity of convected heat made the superintendent rub his hands with pride.

The air heater which supplies the hot air for the wire baking ovens was made by the Morrison Engineering Company. The figures?—electricity at 1½¢, natural gas at 80¢ a thousand. 1500 cu.ft. of gas is used each hour.

Electric Oven Abandoned

When a new method of handling aluminum pistons was proposed by the Smith-Mayer Corporation for Thompson Products, Inc., in Cleveland, Ohio, a considerable portion of labor was saved.

In this installation, aluminum pistons were aged by heating in Westinghouse electric shelf type ovens. The new proposal took care of increased production that would have required two additional electric ovens. However, a single gas-fired unit having a capacity of three electric ovens was installed, using Surface Combustion tile burners on a Smith-Mayer direct-fired air heater furnishing heat to a rack type of oven.

According to A. T. Code, assistant manager of the industrial department of The East Ohio Gas Company, the low cost of gas was the principal feature of advantage over electricity, and a maximum hourly consumption of 375 cubic feet of natural gas is anticipated. The comparative prices of gas and electricity were as follows: 65 cents per M cu.ft. of 1100 B.t.u. natural gas, and 1 cent per K.W.H. for electricity. Shortly after the gas-fired oven was installed the electric oven was abandoned.

Electricity Goes Out

The Times-Dispatch Publishing Company in Richmond, Virginia, used eight Westinghouse Electric immersion units in an 8-ton stereotype pot for a period of twelve months. The average cost per month was $205.38 with electricity at 1.29 cents per kilowatt hour. But no more, out went electricity and in walked gas, arm-in-arm with lower costs and speedier service. And don't think those newspaper fellows don't like speed.

That is not all of the story, for this job enabled Bernard B. Livingston, gas engineer of the Department of Public Utilities, to close an identical job in the evening paper, the *News Leader*, where electric linotype pots are to be replaced by gas as well as the sterotype pot.

Actually the Kemp gas immersion system which was installed in the 8-ton Hoe pot at *The Times-Dispatch* operated faster and more economically with manufactured gas at 65 cents per M cu.ft., so that savings of approximately $120.62 per month were reported after gas was installed.

This sales experience, and the one it led to, make additional land marks on the trail leading away from electric stereotype melting. The trend of a few years ago towards electricity is now reversed, thanks to the development of the immersion system using the principle of gas hot tubes, with its economy and speed.

Getting the "Bull Dog" to Press

When you can really reduce the gas bill and at the same time do the job better, that's service. And the newspaper people are certainly finding it out. If this change to gas hot tubes of the immersion type keeps up, it will soon assume the proportions of a stampede.

Take the *Jersey Journal* for example. This newspaper, published in Jersey City, N. J., recently went modern and installed submerged gas hot tubes for melting the tons of stereotype metal required to get out their various editions. The monthly savings of nearly 60% from using the new Kemp immersion gas heating will very soon pay for the equipment and its installation and will be pocketed by the publishers for many years after that.

W. B. Dodds, of the Public Service Electric & Gas Company, looks at the new installation like a proud daddy looks at his first offspring. Mr. Dodds insists that the speed, uniform heating and saving in dross would make the new gas job worth while even if there was no saving.

ACCOUNTING SECTION

E. B. NUTT, Chairman H. W. HARTMAN, Secretary A. S. CORSON, Vice-Chairman

Selecting and Training the Contact Employee*

By PAUL HOFFMAN
Milwaukee Gas Light Co.
Milwaukee, Wis.

SELECTING and training the contact employee is a subject that has been discussed at innumerable meetings and conventions and, no doubt, anything which may be said has already been spoken or written.

Various companies use different names for their contact departments, but generally the term Service, Order, or Meter Application Department means the same. In one company the employee is known as a "Customers' Representative." This title is applied to the employee at the contact desk and also to the one who calls at the customer's house on a bill investigation. And the name is a proper one, aptly describing the employee's function. He is acting for the customer in aiding him to obtain gas, in steering a complaint or an adjustment order through the company's system, in uncovering the real cause for greater gas consumption, and pointing out ways to conserve gas.

It is rather difficult to outline anything but a general plan although it is universally conceded that all companies should have a man of pleasing personality at the information desk. Can a pleasing personality be developed? Yes, to a certain degree; the most desirable type, however, are innately courteous and agreeable. It is far easier to select a naturally well-mannered employee and teach him, or her, the practices and policies of the company than it is to cultivate spontaneous politeness in one who only may be quite familiar with the system of all departments.

The office contact clerk or customers' representative must have a general knowledge of the work performed in all departments. How is this knowledge obtained? A successful plan is to "farm out" the employee to other departments. Familiarity with all phases of the business cannot be assured through class instruction alone. An exchange of employees, for short periods, with the bookkeeping, the collecting, and the order dispatching divisions will produce an asurance, in tone of voice and directness of manner, that will react most favorably upon the customer.

Sound Program

It is also very advisable, during the training period, to send the contact employee out with a fitter for a few days, and it is still more desirable to have him call at customers' homes on high bill cases for awhile. This latter program will do more than anything else to cultivate in the employee an ability to visualize the customer's premises and the circumstances that have brought forth a complaint to the office.

In fact, one company very intimately connects the office contact force with the street contact force (bill investigators) by means of an ebb and flow of employees between these divisions each week, according to their respective needs for men. Mondays and Saturdays are busy days in the office so several street men augment the office force at desk or counter; Tuesday to Friday, office men settle inquiries at customers' houses. The program has proved sound both economically and educationally.

The customers' representative should know the functions of the various divisions and be acquainted with the personnel in each department in order to direct the customer to the proper persons when the need arises. It is better to direct the customer to a specific person rather than to the department itself, and in cases that are somewhat

* Contribution of Customer Relations Committee.

unusual, it is advisable that the information clerk communicate directly with the person who will handle the customer's case. In this way, a customer will be taken care of promptly and properly.

At the meter application desk or counter most contacts are made; at any rate, many first contacts are made there. It is here that greatest care in the selection and training of employees should be exercised. There is no doubt but that the first contact leaves the most lasting impression in the customer's mind. If that impression is good it certainly is of help in future relations with the customer, but if the impression is unfavorable it is hard to change and it may react to the detriment of future business. At the order desk or counter all clerks should be of neat appearance in respect to dress, and they should have a pleasing manner of speech. One who drawls or speaks too slowly may irritate the customer, but one who speaks in a loud or shrill tone or very rapidly may also annoy him.

At the telephone order desk men should be employed as they convey a greater degree of assurance than women. These clerks, however, must have a good telephone voice. The telephone company is usually quite willing to give assistance in training of this nature, in fact it is not impossible to enroll an employee in a short course of telephoning technique at the telephone company's office.

All order-takers should be thoroughly schooled in the manner in which orders are taken. By this is meant that they should be taught to ask only the necessary questions and confine their replies to sufficient and not superfluous information. It is an excellent idea, for instance, to analyze the questions that must be asked when taking the several kinds of orders so that they are presented in a natural sequence. Furthermore, substantial assistance for the fitter may be obtained by ascertaining exactly the nature of complaints.

If Mrs. Jones reports a leak, tell her the company will send a man at once; does she know where it is? Then if the fitter calls and the mistress is not at home, the fitter can effect a definiteness and continuity of contact which conveys an intimacy of interest that is most comforting.

Is a grate needed for her range? Does she know the make or has she purchased it recently from the company, and thus may that information be obtained from the company's records? Concrete information of this kind may enable the fitter to complete the job on one visit—obviously a mutual advantage. Occasionally, when asking these questions, it is necessary to insert an explanation as to why their answers are helpful in furnishing prompt and complete service.

In the Field

In the field, neatness of dress cannot always be expected in the same measure as in the office. Nevertheless, certain requirements must be laid down. Here too, courtesy must be displayed to the customer at all times. The work to be done must be performed quickly and any dirt created in its execution should be cleaned up by the employee. If, for any reason, the employee calling cannot perform the work required, or for some reason, cannot complete it, he should offer a tactful explanation, but he should be careful, however, and not promise to have the work performed at a specific time. If he is requested, however, by the customer, to state a given time, it is his duty to inform his supervisor or foreman of that fact, and impress upon the latter that a promise, expressed or implied, has been made and that the promise must be kept.

The Customers' Relations Man, or the investigator of high bills, is in a tough spot at the present time, and has been during the period of the depression. Reduced incomes have resulted in a closer check on expenditures. The natural consequence of this control of bills has been a marked increase in the number of high bill complaints. People have been in a somewhat different frame of mind because of their financial embarrassment. In nearly all cases where a complaint has been registered, the customer is sincere in his statements in that economies were effected and should be reflected in the size of the bill. It is hard for him to understand that a bill rendered may be a proper charge for the quantity of gas used, and it is in such instances that the high bill investigator must exercise tact and patience and use every effort in reasoning with the customer and make a real effort to explain the gas consumption.

Much goodwill can be lost if the investigator becomes upset or shows signs of irritation. He should maintain his poise and temper at all times. These high bill investigators should be familiar with the way in which bills are rendered and how the amounts are computed so that they can readily answer all questions put to them. They should have a thorough knowledge of the construction and operation of meters, and should be able to make the usual minor adjustments on all appliances. They also should be able to determine what is wrong, so that any man following them need not go over the same ground before he knows what is to be done. The investigator should also have a fairly good knowledge of the company's policies, as frequently they are called upon to give explanations of certain acts and give reasons why certain things can or cannot be done.

The Meter Reader

Last, but not least, the meter reader must not be overlooked as he is the most regular caller from the company that customers have. He represents, and is to many customers, "The Gas Company." What he says or does reflects favorably or otherwise upon the company. He must display courtesy at all times and he too should be in a position to answer the usual questions which a customer may ask, but it is not expected that he have the wide knowledge that the high bill investigator possesses. He should be trained to turn in to the head of the meter reading group all requests made to him in the course of the day's work, and the same attention should be given these requests as though they were turned in directly by the customer.

This article has tried briefly to bring out what are necessary requisites and qualifications in the selection and training of the contact employee. Various courses on instruction have been mapped out and have been used in some companies. However, no course will satisfy all cases, and it is, therefore, necessary for each company to work out its own training courses and lay down necessary qualifications for a contact employee. Local conditions and the size of the company must be taken into consideration and, after all is said and done, the executives of each company know best what makes up a good contact employee, and when and how to apply corrective measures and when to make a change in the personnel.

ACTIVITY IN GAS ENGINEERING AT BROOKLYN POLYTECHNIC

(Continued from page 266)

A novel application of gas for power production completed during the year is its use as fuel for a 100 H.P. heavy duty bus motor used to drive the propeller of the newly constructed wind tunnel in the Aerodynamic Laboratory at the Polytechnic. The conversion of this unit from gasoline fuel to gas was quite simply accomplished requiring merely the substitution of an inexpensive mixing valve for the carburetor and a minor alteration of the manifolds. The motor operated on gas runs smoothly and quietly and provides speed variation over a wide range with simple control, an important factor in wind tunnel investigations. The unit is giving complete satisfaction and is economically suited to the type of service required of it.

The investigations and developments aforementioned and others of a similar nature completed in previous years are interesting and serve as instructive topics for student work but the foremost contribution of the Polytechnic to the gas industry is of a direct educational nature, namely, its Gas Engineering Course which will begin its eighth year in September. This course, initiated largely through the efforts of Clifford E. Paige, vice-president of The Brooklyn Union Gas Company, has to date given training to more than 250 gas company employees by its series of lectures and laboratory sessions. The lectures are given by men of long experience in the gas business and recognized as specialists in their field. The subjects covered give a broad survey of the field of gas engineering beginning with the subject of gas properties, proceeding through manufacturing processes, distribution, combustion phenomena, domestic and industrial applications and concluding with fuel economics, accounting and public relations.

Method of Authorizing Expenditures And Auditing Cost Plus Contracts*

By G. L. FRAGA

The Brooklyn Union Gas Co.
Brooklyn, N. Y.

ACCOUNTING for property acquired under a cost plus contract follows the same fundamental accounting principles employed in cost accounting. There are, however, certain problems arising out of contracts of this character which require special attention in order that the results obtained shall meet all of the many and varied demands made upon the accounting department of a utility company. The procedure adopted should provide for a complete record of all the essential facts consistent with the simple, understandable, easily referred to record and should provide all the checks and balances necessary including executive control over expenditures.

The accounting forms adopted in carrying out the procedure should be such as to permit easy preparation of accounting information necessary in connection with the issuance of securities, the placing of insurance, cost studies in connection with rate making and studies in connection with interdepartmental or intercompany charges for the use of property. Forms used in connection with the system should also afford control from the viewpoint of auditing as well as executive responsibility.

A properly devised scheme of accounting for property whether acquired under a cost plus contract or otherwise should form the connecting link between the annual construction budget and the perpetual inventory of fixed capital.

A procedure developed by The Brooklyn Union Gas Company and in use by that company is described below in the hope that it might be of interest to those responsible for the accounting for fixed capital acquired under the cost plus contract. The system may be adapted to fit individual requirements without sacrificing any of its advantages.

This company has organized a separate division in its accounting department which is designated as the Authorization and Construction Cost Division. The duties of this division consist of checking authorizations for expenditures, entering the essential facts in permanent records and in auditing cost plus contracts. The work of this division is coordinated with the division of budget control, in the adoption of units of property and in furnishing the division of budget control with the essential information upon completion of a given project.

Authorizations for construction expenditures (See Fig. 1) originate in the various departments and are then forwarded to the Authorization and Construction Cost Division where they are checked to determine

1. The accuracy of the selection of the capital account or accounts to which the project is to be charged.
2. The feasibility of accounting for sub-divisions or units of property as determined by construction engineers.
3. That the description of the project carries sufficient information to identify it.
4. That the statement of the purposes and uses to which the project is to be put is sufficient to meet the requirements of executive approval.
5. That proper reference has been made to the annual construction budget.

When an authorization for expenditures is found satisfactory in all respects it is given a number and routed to the various department heads and entered in

The Brooklyn Union Gas Company
X 46 7500 4 33

AUTHORIZATION
INCLUDED IN BUDGET FOR YEAR 1934

Page 1
of 1 Pages

Subject Works & Station Structures — Authorization No. 16349

Budget No. 6-C

Location Wythe Avenue Station — Date of Starting ....193...

Requested by ....Dept. Head ....193...

Work to be done by Holder Dist. Division ....Dept. ....Dept. Head ....193...

Approved by ....Asst. Chief Engr. ....193...

Approved by ....Auditor ....193...

Authorized by ....V. P. ....193...

Item	Sub-Divisions—Detail sufficiently for Identification	
		600.00
	Total Estimated Cost	$....

To install a gas-fired boiler.

On account of the installation of new Worthington compressors at Newtown Station, steam is not required for pumping at Wythe Avenue Station except during the winter months when it is also required for heating the holders. Therefore, it is necessary to maintain steam in the large coal fired boilers during the spring and fall for heating the station building only. The installation of a gas-fired boiler will make it possible to discontinue operation of the boiler room during the spring and fall months thereby effecting a saving of $1,000.00 per year in the cost of coal and labor.

Item	Accounts to be Charged or Credited	Estimated Cost	Actual Cost
312a	Works & Station Structures Wythe Avenue Station	$600.00	

TO BE REPORTED ONLY WHEN ALL CHARGES HAVE BEEN PASSED FOR PAYMENT

Completion Date....193... Permanent Insurance Placed....

Approvals .... Dept. Head....193... and....Auth. Div....193...

APPROVED AFTER COMPLETION....V. P....193...

Figure 1.

*Contribution of General Accounting Committee.

16349

Wythe Avenue Station (Holder Dist. Division)

312a Works and Station Structures

To install a gas-fired boiler.

Est. Cost:—$600.00

Figure 2.

a tickler record so that the location of the original authorization is at all times known. After an authorization has been passed upon by all interested parties as indicated by the signature of the department head and the Auditor, it is forwarded for executive approval. When this is obtained, the Authorization and Construction Cost Division notifies the interested parties of the fact. A card (see Fig. 2) is then prepared which shows the authorization number, description of the work to be done and the accounts to be charged. This card is filed in the Authorization and Construction Cost Division and copies are forwarded to the Pay Roll Division and the Stores Accounting Division in order to provide the means of checking labor and material.

All capital expenditures whether under cost plus contracts or otherwise are supported by transcripts of labor, material, invoices and miscellaneous charges. These transcripts are checked with the postings made in the authorization ledger from the invoice audit sheets, pay roll distribution sheets and petty cash vouchers. Upon the commencement of work on a given project and at stated periods during the period of construction, a representative of the Authorization and Construction Cost Division inspects the property so as to be in a position to intelligently check charges to the project as they flow into the Authorization and Construction Cost Division. Monthly trial balances of each project in process of construction are taken and proved with the capital accounts in the general ledgers.

Plans and specifications always form a part of a cost plus contract. Immediately upon the approval of an authorization covering a cost plus contract, the construction engineer forwards plans and specifications to various contractors who are requested to submit bids in duplicate. When detailed proposals of given units of work are received by the engineer, he determines which proposal in his judgment is most advantageous to the company. In reaching his conclusion he considers the class of work to be performed, cost, terms, number of working days to complete the work and any other essential facts necessary for consideration in the letting of the contract.

The proposal also contains the necessary facts with relation to rates for labor, liability and compensation insurance, percentages of overheads and the contractor's profits. Having accepted the proposal, the construction engineer initials the same and forwards it to the Authorization and Construction Cost Division. This division then obtains the approval of the various parties interested and records the proposal tying it in with the authorization number as outlined above. The Authorization and Construction Cost Division also forwards a copy to the Secretary of the company who sends a letter of acceptance together with a copy of the contract to the contractor.

All original proposals remain in the files of the Authorization and Construction Cost Division where they are indexed and recorded with a notation of all contracts pertaining to a given authorization. A digest of each contract is entered in the contract book giving all important data in relation to the contract. The information so entered is used in connection with the checking of contractors' bills. Upon completion of preliminary arrangements, including signing and acceptance of the contract, the contractor delivers his equipment to the site preparatory to the commencement of the work.

The field force of the Construction Department (consisting of inspector, timekeeper and material clerk) is usually in the field in advance, and upon delivery of equipment by the contractor, material-received tickets are prepared and signed by the contractor's superintendent and the company inspector. When the contractor starts work, the company timekeeper and the contractor's timekeeper are on hand, and repeat their visits at various intervals during the day; namely: before 12:00 A.M.—after 1:00 P.M.—about 4:30 P.M., etc., to check the time of the men and to ascertain the nature of the work done. Timekeepers and material checkers prepare their time and material tickets in the field office. With these tickets in agreement, they are signed by the company inspector and the contractor's superintendent. These tickets give a description of the work performed on the basis of which the Authorization and Construction Cost Division compile its distribution of labor and material.

Ordinarily the time and material tickets are made in triplicate, but where work is being performed by a sub-contractor the tickets are made out in quadruplicate. The original is forwarded to the Construction Department for the Authorization and Construction Cost Division; a copy is sent to the contractor, and a copy is retained by the timekeeper in the field office for his records. The fourth copy is forwarded to the sub-contractor, if one is employed. The time tickets and material tickets each carry a separate set of numbers. Tickets for each contract are numbered consecutively.

The contractor's bills with the vouchers, time and material tickets, truck hire, rental of pumps, concrete mixers, etc., and any other miscellaneous charges in connection therewith are forwarded to the Authorization and Construction Cost Division by the Construction Department, where the date of the bills, arrival date, amount billed and paid, balance due and the account charged are noted in the contract book. The contractor's bills are entered on their respective sheets which are kept in the contract record book, given a number and, if any work is performed that is not covered by the contract, the bills are marked accordingly. This information is recorded on the time or material tickets by the timekeeper with the notation "Extra Work."

Rates of labor charged are checked with the rates for labor in the contractor's proposal. The material prices and the amount billed by the sub-contractors are checked with the proposals submitted by the sub-contractors and material companies. Rental of plant and equipment, such as steam shovels, pile drivers, floats, scows, pumps, concrete mixers, etc., are checked with the proposals; also the rates for compensation, liability and burglary insurance. The amounts billed by the material companies for sand, stone, cement, brick, lumber, etc., are recorded on the record sheets of the sub-contract book.

Pay roll extensions and additions, material and sub-contractors bills and miscellaneous supplies are verified and checked against the contractor's bills. Time tickets are checked with the original pay rolls, which in most cases are submitted. If pay rolls have not been submitted, a check is made of the time tickets, and the summary is checked with the total number of hours as designated on the bill; the materials are checked with the material-received tickets. Each month during the billing under the contract a visit is made to the contractor's office where vouchers recording payments made by the contractor to vendors are verified and compared with the cancelled

(Continued on page 283)

COMMERCIAL SECTION

N. T. SELLMAN, Chairman J. W. WEST, Jr., Secretary F. M. ROSENKRANS, Vice-Chairman

Gas Refrigeration—An Example Of Coordinated Advertising and Selling*

By LOUIS RUTHENBURG

President, Servel, Inc.

DURING the current year the sale of Electrolux refrigeration in the United States has, for the first time, started to assume a national aspect. As you all know, the limitations imposed by water cooling, prior to 1933, limited our market to a relatively small number of localities. The fact that water-cooled refrigerators were sold by aggressive and courageous gas companies in that small number of localities should be chalked up to the everlasting credit of those splendid pioneers.

The year 1933 was one of great uncertainty for all American business. Most particularly was it a year of great uncertainty for Servel, Inc. and for the utilities that sold Electrolux refrigeration. The air-cooled Electrolux held great promise but, regardless of the fine talent and painstaking care and endless testing that had been applied to its development, it had not met the final test of actual quantity usage under the widely varying conditions that obtain in various parts of the country.

The hottest summer for thirteen years produced ample evidence of sound design and manufacture. Minor difficulties developed with certain models but no essential fault was disclosed.

The one obstacle that had always closed a truly national market to Electrolux refrigeration had been successfully eliminated!

Naturally this had to be done as a step preliminary to effective, large scale, cooperative advertising and selling effort. The result so far accomplished in 1934 serves simply to give one an indication of what can be accomplished after such cooperative effort shall have been well organized with the benefit of accumulated experience. Compared with probable future results, I truly believe that "we ain't been nowhere and we ain't seen nothin'." This statement is made with full appreciation of the splendid—almost spectacular results so far produced as the result of coordinated effort.

The utilities of this country—gas and electric alike—have for many years appreciated the advantages peculiar to the refrigeration load. Not only does the installation of a refrigerator bring about a great increase in load and revenue, frequently converting an unprofitable account into a profitable one, but this is accomplished without added capital cost or change in rate structure. Moreover, the load is virtually constant in its daily and annual cycle—a load characteristic which can only be bettered by that which is discussed far more frequently than found—an off-peak load.

It now seems quite likely that gas refrigeration installed in 1934 will add over two billion feet to national consumption —and that without any capital extension whatever on the part of the gas utilities. Increased load without capital extension seems to be the one answer to the problem of rate reduction and avoidance of public criticism and political persecution.

"Go-Getter Contest"

I assume that you are quite well informed as to Servel's national advertising volume, media, theme and copy; the impressive volume of and fine results from local cooperative advertising; the great quantity and effectiveness of sales helps of various kinds—posters, booklets, envelope stuffers, floor and window displays. By the way, the organizations which have used these materials in the greatest volume are the ones which have made the best showing in the Go-Getter Contest.

That contest, in itself, is an outstanding example of the results that can be accomplished by coordinated effort. My company is most appreciative of the splendid manner in which the gas companies have "gone to bat" and I am sure that our gratification is shared by the officials and sales executives of the gas companies.

The elements and results which I have so sketchily outlined indicate that Electrolux refrigeration is truly entering upon a great national market which will be developed in a degree limited only by our imaginative powers and our joint ability to sell.

Our major mutual problem is just that —"our joint ability to sell."

A good friend of my automobile days said some years ago, concerning automobiles, "Many are bought, but few are sold." The same remark applies to automatic refrigeration in this year of our Lord 1934. There is no royal road to the result which you men and Servel are so desirous of accomplishing. Of all the elements involved, the one of vital importance is better selling. It is a most fortunate circumstance that the destinies of Servel are guided by an internationally known sales and business executive. I refer, of course, to our chairman, Mr. Wenner-Gren. May I quote his statement which many of you read when it appeared in April?

"A first-hand picture of the company's attitude toward the gas utility companies is found in a statement of policy which Chairman Wenner-Gren made to his Board of Directors at the last meeting. The statement is not only an exposition of policy, but is considered an interesting line on the sales and business philosophy of the man Wenner-Gren, who has grown from a salesman to a leading international industrialist only through creative enterprise. The statement in full is as follows:

"Gentlemen, we have not only a responsibility but an unusual opportunity. The name Electrolux has come to stand for leadership in household service throughout the world, and I have striven through every available avenue opened by the skill and genius of capable men to make the product worthy of the name and the ideal. In most of those markets we now have unchallenged leadership and with such a product as we here offer to the fine homes of America, we must see our opportunity and accept our duty intelligently and actively.

"To offer a good product is not the sum of a manufacturer's obligations. The merits of the product must be shown convincingly and in the right manner. People are preoccupied with the manifold interests of daily life, and voluntary examination into the true qualities of a household device is seldom made. This condition is taken advantage of by those who loudly proclaim surface appearances and novelties, whereas fundamentals should be considered, first of all—and, therefore, we must work thoroughly.

Natural Outlet Through Companies

"I have learned that it is a great public service to educate and interest competent sales people to correctly guide the thought and persuade the decision of a prospective purchaser toward the most intelligent course for human betterment. Such opportunity is in the hands of the management of our company, and we have associated with us other important man-

*Address before New York—New England Regional Gas Sales Conference, New London, Conn., June 28, 1934.

agements whose interests are blended with ours and with whom we have the privilege of cooperating to our mutual and vital advantage.

"To an experienced man it is clear that no product could have a more natural outlet or a more limitless opportunity than the Electrolux refrigerator will find through the facilities of the gas companies whose investments touch each other town-to-town and city-to-city throughout this land, if those facilities are invited by intelligent approach and plans in the first place, and by experienced practical, and industrious contact in the maintenance of relationships to mutual benefit and profit. In their load building, the gas companies need Electrolux; and for its most natural sales, installations and service channels, Electrolux needs the gas companies. However, those needs alone do not create sales in satisfactory measure either to the gas companies or to our company. Obviously, there must be sales activities on their part and on ours and I want to point out that we must more fully discharge our responsibility in this respect. We must supply the kind and the amount of practical cooperation which will be most helpful in converting these opportunities into sales—profitable to the gas companies and ourselves. I cannot stress too strongly that all such proposed service shall be thoroughly practical, and that is the reason I have brought into our management men of such broad and successful experience in this particular type of merchandising. There is ample reason for the good reputations these men have for ability and sound judgment; and they likewise are men of such zeal that I am sure that in the businesslike promotion of our own business it will be found that we have made a genuine contribution to the interests of the gas industry."

Cooperation With Utilities

I am sure that we can all subscribe without reservation to the policy so well enunciated by Mr. Wenner-Gren. The controlling theme of Servel policy in respect to Electrolux sales is, of course, cooperation with the gas utilities to the limit of our ability. Next, we must establish territorial quotas consistent with market potential. Finally, we must cooperate with the interested utilities in such manner as to bring about attainment of those quotas. Our plans are being rapidly developed with these objectives in mind.

Anything that can be done to make possible the purchase of Electrolux refrigeration by families of small incomes will represent a step in the right direction. I am deeply conscious of the responsibility of Servel in this particular matter. But high finance charges are a serious obstacle, no less than relatively high installed price. The monthly payment is the crux of the situation. High finance charges are made necessary by the prodigious cost incurred by finance companies in booking, billing and collecting small monthly accounts. Here is a field in which the utilities can serve admirably by devoting their existing facilities to this work.

Some years ago a new salesman sold an astonishing number of Frigidaires during the last quarter of the year. When he was called to the convention platform to explain how he did it he said "Well, fellows, to tell you the truth I didn't know I wasn't supposed to sell in the last quarter." Too many refrigeration salesmen and sales executives seem to know that they aren't supposed to sell refrigerators after July first. Look at the seasonal sales curve if you don't believe that "many are bought but few are sold."

Unless I am badly mistaken you are all greatly interested in the possibility of cost reduction for Electrolux refrigeration. I do not know of more effective method of cost reduction than flattening the production curve, which can only be done safely as the sales curve is flattened. The Electrolux factory will operate this year at 46 per cent load factor. By that I mean that if our May shipments were multiplied by twelve we should ship more than twice our projected output for 1934. Or to put the same fact in other words—given constant monthly production; we could produce our current year's output with less than half our present capacity. That represents horrible inefficiency—bad expense distribution, poor labor efficiency, high material cost, too many faulty refrigerators.

Automatic refrigeration is used just as consistently on New Year's day as it is on the Fourth of July. Why isn't it sold consistently throughout the year? Because we are still ice-minded. We know we must buy summer refrigeration, but we think God gives us winter refrigeration. Kitchen temperature is just about as high in the winter as it is in summer, and good preservation is a function of kitchen—not outdoor—temperature. Let's keep up the selling effort. After all, we are not selling straw hats nor skiis.

To Simplify Line

Another source of high cost is multiplicity of models. Unfortunately the cost finding system has not been devised which will accurately reflect the cost of building relatively few refrigerators to special specifications. There is always the salesman who thinks he could sell something different if he had it to sell. As soon as he has it, he finds that he needs something slightly different. Thus are costs enormously increased. With your cooperation, we propose to simplify the Electrolux line for 1935 without in any way restricting sales possibilities. Entirely apart from the possibility of cost reduction, simplification has many advantages. It simplifies the salesman's job, allows him to concentrate and intensify his effort. It increases stock turnover, minimizes dead stock and improves the net profit.

Appearance of the present product is good. We are concentrating much effort and money toward making that of the new product better. Similar studies are being made of convenience features. Every complaint is being analyzed to the end that it will not reoccur in the improved product.

Every detail of plant arrangement and equipment is being studied with a view toward improving the quality of the product and reducing cost.

I know that the service and warranty matter is one which deeply concerns every one of you. In the electrical refrigeration industry I have lived with this problem for five years. Frankly, I do not know the answer, as yet, where Electrolux is concerned—I think we can find it. I doubt if we shall go off half-cocked. I hope we shall not take the chances with public good will and tempt fate as some of our friends in the electrical field are doing. We are working hard at this problem and hope to have something definite to say to you in the near future. In this matter, as in all others, we shall welcome your suggestions and feel sure we shall have your understanding cooperation.

In this matter of cooperative selling and advertising, I cannot begin to express adequately our deep appreciation for the good offices of the American Gas Association and the regional associations.

Movies Aid Gas Sales in Milwaukee

THE National Enterprises, under the direction of its president, B. Donald Schulman, conducted an effective and spectacular campaign for the Milwaukee Gas Light Company, based on a motion picture tie-up which is receiving the attention and consideration of a number of gas company executives. The showmanship of the moving picture industry was utilized effectively to lend color and popular appeal to the services of gas in the home.

The complete story, by Bernard T. Franck of the American Light and Traction Company, of this activity has been mailed to all gas company member delegates by N. T. Sellman, chairman of the Commercial Section. Mr. Franck is enthusiastic about the highly satisfactory sales results achieved. It would be well for all gas companies to digest this interesting story.

May Open New Field in New York

A "wildcat" gas well drilled by the Sinclair Refining Company in the township of Willing, near Wellesville, N. Y., gauged 8,200,000 cu.ft. July 13 as workmen were completing cement work around the casing, using the Haliburton process. The discovery of this well, which is located on the Smethport anti-cline which runs from Smethport, Pa., to Greenwood, N. Y., may open up a new gas field in New York State, drillers said.

HOME SERVICE COMMITTEE

DOROTHY E. SHANK, Chairman — JESSIE McQUEEN, Secretary

Gas Proves Feature At Economics Convention

THE American Home Economics Association held its twenty-seventh annual convention at the Hotel Pennsylvania, in New York, June 25-30. The attendance of approximately 2,500 was largely made up of heads of home economics departments in colleges and schools; state and city home economics supervisors and teachers; state and county leaders of home demonstration work; institution executives including hospital dietitians; homemakers; social workers; home economics directors of business organizations and government bureaus; home service directors.

Among the home service directors present were: Mrs. Carolyn W. Bixby, Roberts & Mander Stove Co., Boston, Mass.; Laura Judd Bryant, Union Gas & Electric Company, Cincinnati, Ohio; Mrs. Ruth Carmen, Associated Gas & Electric System, Elmira, N. Y.; Merab Easton, Florida Power & Light Co., West Palm Beach, Fla.; Mary Evans, Scranton-Spring Brook Water Service Co., Scranton, Pa.; Mrs. Lyda Flanders, Worcester Gas Light Company, Worcester, Mass.; Bessie M. Harris, The Connecticut Light & Power Co., Bristol, Conn.; Irene Hickey, Detroit City Gas Company, Detroit, Mich.; Mrs. Ella L. Lambert, Milwaukee Gas Light Co., Milwaukee, Wis.; Jane Roberts, Roberts & Mander Stove Co., Philadelphia, Pa.; Dorothy Shank, American Stove Co., Cleveland, Ohio; Ruth Sheldon, Washington Gas Light Co., Washington, D. C.; and Beatrice Cole Wagner, Philadelphia Gas Works Co., Philadelphia, Pa.

Home Service Directors Present

Home service directors from the Metropolitan New York and New Jersey companies also were much in evidence, both in attendance and in assignments to committees in charge of convention arrangements.

The 1934 Convention was developed around the theme of, "The Consumer and the New Economic Order," applying it to the different departments of the Association. The entire week was devoted to a discussion of this subject; to the business of the association and to entertainment.

Home service activities can tie up directly with almost every department of the association. Colleges and universities are becoming more and more interested in the study of gas equipment and in planning courses for students who are desirous of going into home service work. Those teaching in elementary and secondary schools are usually glad of cooperation in the teaching of equipment and in the study of gas. Through the extension service cooperation can be carried on, especially along the line of kitchen planning. Fine cooperation can be secured with the home economists connected with business organizations by securing and using their material and by assisting them in the local community whenever possible.

The homemaking department is certainly a fertile field for cooperation since this group of consumers is interested in the latest developments in equipment and in food research, both of which can be given by up-to-date home service departments whenever an opportunity affords.

Home service is always interested in research, the newest in every line of information that touches the home directly. By cooperation with social service agencies home service departments have proved over and over again their effectiveness and helpfulness in carrying through a worth-while program.

Among the interesting addresses was the one by Dr. Paul Douglas, of the University of Chicago, who spoke on, "The Place of the Consumer in the New Industrial Set-up." Dr. Douglas gave an interesting talk on the New Deal and was very much in favor of general price reduction and of consumer organization.

There were discussions of such topics as, "What Consumer Standards Mean to Industry"; "Fair Prices for the Consumer in the New Economic Order"; "Consumer Protection and the AAA"; "Consumer Protection and the NRA"; "Food and Drug Legislation"; "Necessary Changes in the Program of Home Economics in Colleges and Universities in the Light of the New Social Values"; "Youth and the Family in the New Deal"; "The Contribution of Business to the Education of the Consumer through Research"; "Placing the Results of Research before the Consumer"; "The Economic Education of the Consumer"; "Possibilities of Advertising as a Help to Homemakers"; "Problems in Informative Advertising." There were also a great many papers on the latest findings in food and nutrition research, as well as subjects of a more general nature.

One of the interesting reports given was made by the Department of Home Economics in Business. A progress report of a survey to ascertain the amount of research that had been done in universities but financed by industry revealed that only 16 of the questionnaires sent out had been returned. Not all of the 16 reported the amount of money spent in research by them but those that did report showed approximately 2¼ million dollars have been contributed in the leading colleges and universities of this country. In every case the research has been done under the direction of the most outstanding of nutrition specialists in our leading educational institutions, as most of this money was spent for food research. This did not include the vast sums "spent for research on product improvement and development in the laboratories of the commercial firms themselves."

A.G.A. Exhibits

An exhibit was held in connection with the convention, approximately eighty commercial concerns and industries being represented. One of the most attractive exhibits was that of the American Gas Association, cooperating with the Consolidated Gas Company of New York, The Brooklyn Union Gas Company, the Brooklyn Borough Gas Company, and the International Nickel Company, in a display of a modern gas kitchen. The display department of the Consolidated Gas Company prepared the exhibit of cabinets, gas range, gas refrigerator, Monel metal sink, and planning desk in all white with soft blue walls and some red in the accessories. Much favorable comment was expressed by visitors on the attractiveness of the kitchen and over one thousand registered for material to be sent them on gas equipment.

The home service directors of the companies interested were in constant attendance at the booth, and judging by the questions asked, kitchen planning has a definite attraction for this group of home economics women, teachers in the schools and colleges showing particular interest.

To say the least, it was a week crowded with interest, entertainment and instruction! In addition to entertainment features, there were a great many educational trips planned for those desiring to take advantage of them. They visited manufacturing plants, testing laboratories, medical centers, department stores, kitchen centers, and home service departments of the gas companies.

TECHNICAL SECTION

O. S. HAGERMAN, Chairman H. W. HARTMAN, Secretary C. A. HARRISON, Vice-Chairman

Heavy Oil Tar Emulsions in the Water Gas Process

IN TWO PARTS—PART II

By JEROME J. MORGAN
and
CHARLES F. STOLZENBACH

The asphaltenes obtained by the modified Marcusson method from heavy oil tars appeared as a dark-brown or reddish-brown colored, hard, finely divided solid. It has a fusing point of approximately 284° F. (140° C.), and melted into a viscous black liquid. Long continued heating evolved steam, carbon dioxide and oil vapors, and also raised the fusing point. When the liquid was cooled, a hard, black solid with a conchoidal fracture was obtained. This, when pulverized, was dark-brown in color and resembled in appearance the original asphaltenes. Heating the asphaltenes to high temperatures produced a coke and small amounts of oils, water and gas.

The asphaltenes obtained by the modified Marcusson method were completely soluble in benzol, chloroform and carbon disulphide, partially soluble in acetone and in ethyl ether, but insoluble in petroleum ether, hexane, gasoline, carbon tetrachloride, ethyl alcohol and acetic acid. Ultimate analysis of a sample of freshly separated asphaltenes and a sample exposed to a stream of oxygen at room temperature for several days gave the following:

	Fresh Sample of Asphaltenes % by Weight	*Oxidized Sample of Asphaltenes % by Weight*
Carbon	89.49	88.37
Hydrogen	5.57	5.35
Sulphur	3.65	3.45
Nitrogen	0.65	0.59
Ash	0.71	0.16
Oxygen, by difference	0.00	2.08
	100.07	100.00

From a chemical standpoint, asphaltenes are thought to be poly-cyclic compounds, akin to unsaturated naphthenes and terpenes, rather reactive toward oxygen and sulphur and readily polmerized. The sulphur cannot be removed by sodium hydroxide. Heating, oxidation, or addition of sulphur alters the asphaltenes, producing ultimately substances similar to the so-called "free carbon." Asphaltenes are sensitive to light and on exposure to direct sunlight produce benzene insoluble products.

As has been indicated in the review of previous work, asphaltenes have been suspected of contributing to the formation of oil field emulsions, but there has been no definite proof that they acted in this capacity.

When asphaltenes separated as described from heavy oil tars were added to a sample of East Texas heavy oil which alone does not produce stable emulsions, a series of stable emulsions was obtained as shown in Table 3, and Figure 3. This gives definite proof that the asphaltenes are the primary stabilizing agent in heavy oil tar emulsions. Additional proof of the emulsifying properties of the asphaltenes was obtained by the production of stable emulsions through the addition of asphaltenes to such substances as benzene, xylenes, mineral lubricating oils, topped Pennsylvania crude oils, water gas tars, and residual tar oils, none of which alone yielded stable emulsions with water. Thus when about 5% of asphaltenes was added to one of the above substances and the mixture was agitated with an equal volume of water a stable emulsion was produced

TABLE 3

RELATION BETWEEN ASPHALTENE CONTENT AND WATER SEPARATED FROM AN EAST TEXAS HEAVY OIL EMULSION CONTAINING 50% WATER BY VOLUME

Asphaltenes Added % by Weight, Dry Basis	*Separation of Water Caused by Heating for Two Hours at 190° F., % of Initial Water Content*
0.0	98.0
2.0	67.0
5.0	31.0
10.0	10.0
20.0	9.0

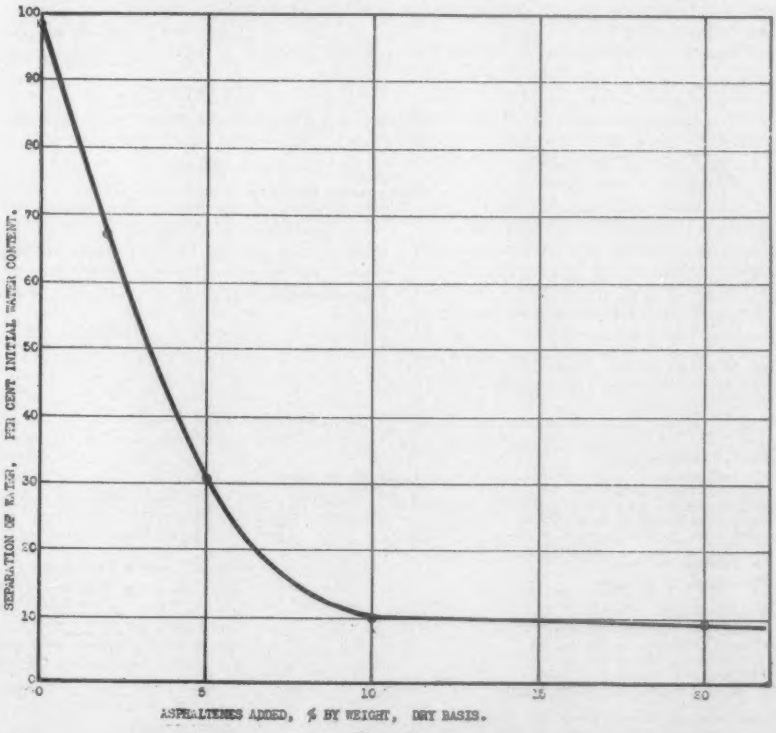


Figure 3

Separation of water from an East Texas heavy oil emulsion stabilized by asphaltenes. The emulsion contained 50% water by volume initially and was treated by heating for two hours at 190° F.

in each case. In each instance when one of these emulsions was examined microscopically, the water droplets were found to be enveloped in a membrane similar to that in the heavy oil tar emulsions previously examined.

A stable emulsion was also obtained by agitating a Mexican crude oil containing 36.5% asphaltenes by weight, or a topped California crude containing 20.5% asphaltenes, with an equal volume of water. Microscopical examination of these emulsions also showed the presence of the membrane about each water particle.

A rather striking demonstration of the membrane forming properties of the asphaltenes separated from heavy oil tars is given as follows: If a little solid asphaltenes is sprinkled upon the surface of hot water and a few drops of benzene, toluene or zylenes are added, the asphaltenes dissolve and give a thin layer of solution on top of the water. In a few minutes the solvent evaporates and leaves a thin, continuous, tough, elastic film upon the surface of the water. This membrane is bonded to the sides of the container and completely covers the surface of the water. A membrane thus prepared with an area of about six square inches supported about ten grams of sand without breaking. By vigorous stirring of hot water upon which a layer of asphaltenes dissolved in benzene is present, an emulsion can be produced, in which drops of water are enveloped by this membrane and float in the surrounding body of water.

The above results and observations indicate clearly that the asphaltenes are the source of the stabilizing membrane in the heavy oil tar emulsions. It is probable, however, that the asphaltenes have been altered somewhat in the formation of the membrane, for the latter differs somewhat in solubility from the original asphaltenes. In support of this it has been observed: (1) the membranes which were seen under the microscope to surround the water droplets and the films produced as described on the surface of water in a beaker were not completely soluble in benzene while the asphaltenes which were separated from the tars were, and (2) the membranes surrounding the water droplets, as has been previously noted, are soluble in acetone while the asphaltenes separated by Marcusson's method are only partially soluble. Such an alteration of the asphaltenes may be caused by exposure to light, by oxidation, or by contact with water, and is not surprising when one considers the unstable nature of these substances.

Correlations Between Properties of Oils and Tars Produced by Gasification

It has been demonstrated above that asphaltenes are the source of the membrane which is the primary stabilizer in heavy oil tar emulsions. It seemed desirable, therefore, to determine whether there was a relation between the asphaltene content of the oils used as carburetting material in the water gas process and the asphaltene content and stability of the tar emulsions formed in the process. If such a relation were shown, it might provide a means of choosing a heavy oil for carburetting which would not form stable tar emulsions.

The analyses of the heavy oils used for the following tests are given in Table 4. They were investigated by subjecting them to a laboratory cracking test in an apparatus similar to that described by I. B. Dick.[4] This apparatus consisted of a silica reaction tube, two inches (5 cm.) in diameter and thirty-two inches (81 cm.) long heated in a vertical, electric tube furnace. The oil for test was contained in a copper reservoir surrounded by a thermostatically controlled water bath. It was forced into the furnace from the reservoir by water from a burette under air pressure. The rate of displacement of oil from the reservoir was controlled by a needle valve in the water line. Water for steam generation was forced into the furnace from a burette by air pressure. The cracking atmosphere was composed of 50% hydrogen and 50% steam, by volume. The oil and water entering the reaction tube were vaporized by dropping upon crushed silica contained in a basket of nichrome wire. The oil vapors then passed down through the hot zone of the furnace where they were cracked.

In using this apparatus to study the characteristics of the tars formed by the gasification of these heavy oils, it was necessary in order to obtain sufficient tar in a day for test to increase the oil rate considerably above that previously determined as desirable when the apparatus was used for the determination of the gas enrichment value of oils.[4] To compensate for this increase in oil rate the

TABLE 4

CHARACTERISTICS OF HEAVY OILS AND TARS PRODUCED THEREFROM IN THE MODIFIED LABORATORY CRACKING TEST

	Topped Pennsylvania Crude	*East Texas Heavy Oil*	*West Texas Heavy Oil*	*East Venezuela Heavy Oil*	*California Heavy Oil*	*Venice, California Heavy Oil*	*50% East Texas Heavy Oil + 50% West Texas*	*60% East Venezuela + 40% East Texas Heavy Oil*	*50% East Texas + 50% California Heavy Oil*
Oil:									
Spec. Grav. 60°/60° F. [1c]	0.8498	0.9123	0.9400	0.9685	0.9800	0.9419	0.9261	0.9610	0.9600
°A. P. I. Grav. at 60° F. [1c]	35.0	23.6	18.4	14.4	12.6	18.8	21.2	15.7	15.9
Carbon Res., % by Wt. [1d]	0.49	4.34	6.32	11.91	8.30	8.77		10.80	6.71
Asphaltenes, % by Wt.	0.03	1.64	1.93	12.60	14.00	14.40	1.78	9.12	11.05
Viscosity, Say. Furol at 122° F., Seconds [1a]	57	40	78	350	300				
Sulphur, % by Wt. [1e]	0.17	0.72	2.18	2.10	2.31				
Gas Enrichment Value at 1,500° F. [4]									
Thousands B.t.u. per U.S. Gallon Oil	126	116	104	104	102	97	110	108	104
Oil Gas:									
B.t.u. per Cu.Ft.	2385	2180	1950			2050	2037		
Cu.Ft. per Gal. Oil	52.8	53.0	54.0			47.4	54.0		
Modified Cracking Test:									
Temperature, °F.	1500	1500	1500	1500	1500	1500	1500	1500	1500
Volume Oil Cracked, ml.	309	367	346	350	270	387	390	340	300
Tar Emulsion Recovered, gm.	2	151	213			190	180		
Dry Tar Produced, gm.	1	22.6	32			44	36		
Dry Tar, % Oil Cracked	0.3	8.2	9.3			11.7	9.2		
Tar Emulsion Formed:									
Water, % by Weight		85.0	85.0	71.0	80.0	77.0	80.0	77.0	80.0
Dehydrated Tar:									
Spec. Grav. at 212° F.	1.1	1.10	1.10	1.1	1.13	1.13	1.1	1.13	1.15
Free Carbon, % by Wt.	1.0	3.21	9.65	12.00	13.0	20.00	7.47	14.70	15.20
Asphaltenes, % by Wt.	0.05	12.60	19.90	20.20	23.00	25.8	20.1	27.7	28.2
Apparent Viscosity, Saybolt Furol, 212° F. Seconds	100	60	550	150	180	150 150	80	150	200
Separation of Water From the Emulsion on heating for 2 hours at 190° F., % initial water content.	100	84.0	69.5	64.5	47.5	13.8	21.8	59.0	28.0
Average Diameter of Water Droplets, microns	100	40	30			15	30		

cracking tube was partially filled with crushed silica. Steam was also used along with the hydrogen to produce the cracking atmosphere. Conditions were regulated so that the number of heat units in the oil gas produced from a gallon of oil was the same as that obtained when the same oil was tested for gas enrichment value alone by Dick's method.[4] Nineteen cracking tests were made in determining these conditions, which are as follows:

Oil rate	6.41 cu.in./hr.	105 ml./hr.
Hydrogen rate	9 cu.ft./hr.	0.25 cu.m./hr.
Steam rate	9 cu.ft./hr.	0.25 cu.m./hr.
or	8.92 cu.in. of water/hr.	146 ml. water/hr.
Temperature at center of reaction tube	1500° F.	816° C.

Reaction tube half filled with crushed silica.

The outlet vapors were cooled in a vertical, water-jacketed condenser, and the condensate caught in a trap. On account of the steam content of the cracking atmosphere, both water and tar vapors were condensed together, which produced an emulsion in the trap. The formation of an emulsion in this manner permitted tests to be made to determine the stability of the emulsions produced from the heavy oils by these cracking conditions.

The emulsions produced were tested for stability by determining the amount of water separated by heating for two hours at 190° F. (88° C.). The water separated from the emulsion was removed by a pipette and the loss in weight of the tar emulsion determined. The average diameter of the water droplets in the emulsion was also determined.

Another portion of the emulsion was dehydrated. On account of the small samples obtained, the water was determined by distillation after toluol had been added to the emulsion.[5b] This served also to dehydrate the tar emulsion, the dry tar recovered by distilling off the toluol.

Determinations of the specific gravity, viscosity, "free carbon," and asphaltenes were made on the dry tar. A two-gram sample was dissolved in hot benzol for the estimation of the "free carbon" content, and the filtrate used to estimate the asphaltene content. The specific gravity was determined in a capillary pycnometer about a milliliter capacity, or by the method of suspension in a fluid of equal gravity. For the determination of the apparent viscosity, a short length of tubing drawn to an orifice at one end was employed. This was steam jacketed. Each viscosimeter was calibrated before use by glycerine so that the readings obtained could be converted to viscosities in seconds as determined by the Saybolt Furol viscosimeter.[5a] Owing to the small bore of these instruments, and the physical nature of the tar, a new viscosimeter had to be made for each determination.

Nine heavy oils were tested in this manner. The data on these are shown in Table 4. The Pennsylvania crude oil was paraffinic and almost free of asphaltic materials. Before using this it was topped by removing the distillate up to 392° F. (200° C.). The California oils were asphaltic in nature, and the other oils were intermediates.

The results of our modified cracking tests are given in Table 4. The tars produced from these different oils at 1500° F. differ widely. In the case of the Pennsylvania oil, the water separated easily from the tar emulsion, and it was doubtful whether a real emulsion was formed, as there was no evidence of a stabilizer in the mixture. There was little if any difference in the asphaltene content of the tar and of the oil. The "free carbon" of the tar was low.

If we consider the five unmixed heavy oils, namely, East Texas, West Texas, East Venezuela, California, and Venice, California, which are arranged in the order of increasing asphaltent content, from 1.64 to 14.40 per cent, it will be noted that the asphaltene content of the tars produced increases in the same order from 12.6 to 25.8 per cent, and that the free carbon content of the tars also increases in the same order from 3.21 to 20.0 per cent. The stability of these tar emulsions increases as measured by the decrease in the amount of water separated on heating for two hours at 190° F. from 84.0 to 13.8 per cent. There was also a decrease in the average size of the water droplets from 40 microns in the case of the East Texas oil to 15 microns in the case of the Venice, California, oil, although the sizes for all of the intermediate oils were not determined. It is to be noted that the increase in stability of the emulsions and the decrease in the size of the water droplets are in the same order as the increase in the asphaltene content of the original heavy oil.

Similarly, when we consider the results obtained from the three mixed heavy oils, which vary in asphaltene content from 1.78 to 11.05 per cent, there is an increase in the same order in the asphaltene content of the tars from 20.1 to 28.2 per cent, and in the "free carbon" content from 7.47 to 15.20 per cent. The stability of these emulsions as determined by the water settled in two hours at 190° F. fails, however, to place these oils in the same order, the figure for the East and West Texas mixed oil being out of line, both with the asphaltene content of the oils and tars, and with the stability which might be predicted from the settling tests on the tars from the two oils cracked separately. It is to be noted that if the stability were tested by a centrifuge test at room temperature, the figures for the water separated are 37.2 per cent for the East and West Texas mixture, 18.5 per cent for the East Texas and East Venezuela mixture, and 17.5 per cent for the East Texas and California mixture, which places these oils in the same order as their asphaltene contents.

In comparing these results, it is seen that the mixtures of East Texas and the other heavy oils produce tars which are not comparable with the tars obtained from the components in the mixture.

To determine the effect of gasification temperature on the characteristics of the tars produced, the West Texas heavy oil was cracked at temperatures of 900°, 1100°, 1300°, 1500°, and 1700° F. (482°, 593°, 704°, 816°, and 927° C.). In these experiments only a small amount of tar was produced, and as not all of it could be recovered, no tar yields are given. Qualitatively, the amount of tar produced decreased as the cracking temperature increased. The results of these tests are given in Table 5, and Figure 4. Study of these results shows that both the asphaltene content and the "free carbon" content of the tars produced increase as the cracking temperature is increased from 900° to 1700° F. The emulsions produced at 900°, 1100°, and 1300° F., while of relatively low asphaltene and "free carbon" contents are stable due to the small difference in density between the tar and water phases. Microscopical observation showed that these emulsions were not stabilized to any great extent, as collisions of water droplets frequently resulted in coalescence. There was no protective membrane about most of the water droplets. Treatment of these emulsions by heating or centrifuging results in the formation of water drops a quarter of an inch or larger in diameter, im-

TABLE 5

CHARACTERISTICS OF TAR PRODUCED IN THE LABORATORY FROM A WEST TEXAS HEAVY OIL

Cracking Temperature, °F.	*900*	*1100*	*1300*	*1500*	*1700*
Separation of Water from the emulsion, % by weight,					
By Gravity					
at 70° F., in 24 hours	0	0	0	0	0
at 190° F., in 2 hours	1	1	5	59	—
By Centrifuge					
at 70° F.	1	1	10	26	—
at 200° F.	2	2	40	78	75
Analysis of Dehydrated Tar:					
Specific Gravity, 60°/60° F.	0.93	0.98	1.05	1.10	1.15
Free Carbon, % by Weight	0.01	0.48	5.73	9.65	10.82
Asphaltenes, % by Weight	1.98	2.74	14.22	19.90	22.10

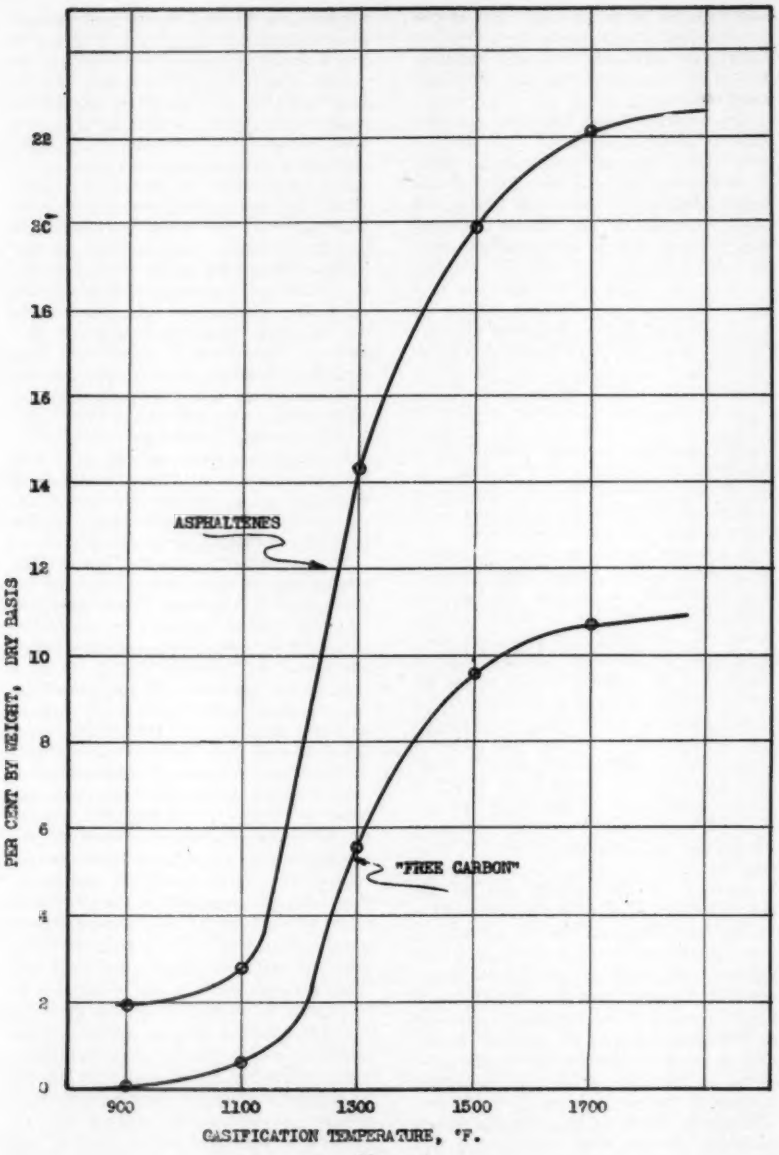


Figure 4

Characteristics of tars produced in the modified laboratory cracking unit from a West Texas heavy oil

bedded in the body of the emulsion. These emulsions will coalesce both spontaneously and upon treatment and produce large drops of water, but these drops cannot settle out of the emulsion as the difference between the density of the two phases, which is the driving force toward separation, is extremely small. The tar emulsions produced at 1500° and 1700° F. are true emulsions; are stabilized by their asphaltene content, and have the asphaltene membrane enveloping each water globule.

Conclusions

(1) Heavy oil tar emulsions, which are of the water in oil type, are stabilized primarily by a membrane, surrounding the water particles, which prevents their coalesence even when the particles collide, as has been observed under the microscope.

(2) The asphaltenes present in heavy oil tars are the source of this membrane, which, however, differs somewhat in solubility from the asphaltenes themselves.

(3) The stability of emulsions made from mixtures of heavy oil and asphaltenes increases with the asphaltene content of the oil.

(4) The so-called "free carbon" in heavy oil tar emulsions serves as a secondary stabilizer, and it has been shown that for a series of tars containing approximately the same asphaltene content the stability is increased by an increase in the "free carbon" content.

(5) The laboratory cracking test used in the determination of the gas enrichment value of carburetting oils has been modified so that it can be used in evaluating the tar emulsion forming properties of carburetting oils when used in the carburetted blue gas process.

(6) In general, the stability of the tar emulsion formed in the gasification of heavy oils at a given temperature increases with an increase in the asphaltene content of the heavy oil. However, the stability of tar emulsions from mixtures of heavy oils cannot be predicted from the asphaltene content of the mixture, nor from the stability of the tar emulsions formed from the component oils.

(7) The asphaltene content and the "free carbon" content of the tars formed by the gasification of heavy oils in the range 900°-1700° F., increase with a rise in the cracking temperature. However, an account of changes in the specific gravity of the tars and probably also in the nature of the asphaltic compounds formed at different temperatures, the stability of the emulsions cannot be correlated with the asphaltene contents of the tars formed at different temperatures.

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TESTING LABORATORY

R. M. CONNER, Director Managing Committee: J. S. DeHART, Jr., Chairman N. T. SELLMAN, Secretary

Standards Available for Gas Refrigerators And Gas Appliance Pressure Regulators

As a result of action taken by the American Gas Association Approval Requirements Committee at its June meeting, gas refrigerators and domestic gas appliance regulators may now be submitted to the Laboratory for test and subsequent certification. Sets of standards covering these two types of equipment received final approval and are now in shape to be submitted to the American Standards Association for endorsement as American Standard. Both sets of requirements, Approval Requirements for Gas Refrigerators and Listing Requirements for Domestic Gas Appliance Pressure Regulators, become effective on January 1, 1936. Testing at the Laboratory and subsequent granting of A. G. A. Approval or listing may be accomplished at any time prior to that date at the option of the manufacturer.

The Approval Requirements for Gas Refrigerators are important in that they permit a significant extension of the A.G.A. Laboratory program of approval for complete gas-burning appliances. The use of gas refrigerators has in the past few years become widespread, and it is appropriate that the American Gas Association now provide nationally accepted standards of construction and performance for such equipment.

The Listing Requirements for Domestic Gas Appliance Pressure Regulators offer a somewhat different problem than do the approval requirements provided for complete and self-contained gas appliances. These standards constitute the fourth set in a new series of A.G.A. requirements being developed to cover gas appliance accessories or appurtenances. Inasmuch as the successful operation of gas appliance accessories, unlike complete gas appliances, depends in part upon the manner of their installation and is not wholly determined by the features of design they incorporate, unqualified A.G.A. approval cannot, obviously, be accorded such devices. Therefore, since some sort of construction and performance standards for gas appliance accessories and other appurtenances is highly desirable, it has been decided to grant a "listing" rather than an "approval" to equipment of this type complying with the Association's requirements.

The standards governing such certifications are, therefore, called "listing requirements." Such listing requirements already exist for draft hoods, gas burner valves (cocks), and gas conversion burners. The requirements for domestic gas appliance pressure regulators under discussion constitute the fourth set of such listing standards which have recently been completed by the Association.

In addition to the standards for the four types of appliance accessories just noted, requirements are completed, with the exception of one or two minor points, for such devices as: Relief and automatic gas shut-off valves for use on water heating systems, automatic main gas-control valves, automatic devices designed to prevent the escape of unburned gas, semi-rigid gas appliance tubing and fittings, and gas range, water heater and space heater thermostats. When these standards will have been completed and duly approved, it will be possible to obtain A.G.A. listing for practically every commonly used variety of domestic gas appliance accessory.

Instead of the Laboratory Seal of Approval used on approved gas appliances, tested and listed accessories will be identified by the Laboratory Listing Symbol, which is composed of the letters "A.G.A." Further data concerning the design and use of the Listing Symbol as well as the Laboratory Seal of Approval, will be found in the A.G.A. Requirements for Official Marking of Approved Gas Appliances and Appurtenances, and Listed Accessories.*

The testing and certification of gas appliance accessories and gas conversion burner units should not only greatly benefit accessory and conversion burner manufacturers, but should likewise be of value to gas companies and the ultimate user of the product.

* Copies of these requirements may be obtained upon application to the A.G.A. Testing Laboratory, 1032 East 62nd Street, Cleveland, Ohio, or to the American Gas Association, 420 Lexington Ave., New York, N. Y.

Studies Ratio of CO to H_2

STUDIES at the Laboratory involving the fundamental relationships which exist in the industrial application of city gas have demonstrated a definite need for information on the very important relationship that exists between the percentage of hydrogen and carbon monoxide in flue gases resulting from gaseous combustion. In previous research work at the Testing Laboratory it had been tacitly assumed on the basis of limited experimental data that the ratio of carbon monoxide to hydrogen in reducing products remained fixed irrespective of flue gas temperature and varied only with the type of gas being consumed. Nevertheless, the error involved in the calculations then at hand was apparently negligible. Recently, however, since precise means heretofore unavailable, of measuring high gas temperatures have been developed and exact information is more acutely needed, work has been undertaken to obtain a truer appraisal of such conditions. Appropriate research has accordingly been instigated.

There seems to exist a decided divergence of opinion and experimental fact concerning the magnitude of the so-called "CO to H_2 Ratio" at different temperatures and with different fuel gases. The values of $1\frac{1}{2}$ for natural gas and 1 for manufactured gas at relatively high flue gas temperatures have been used at the laboratory from time to time without seeming to introduce undue error; recent investigators have set the figure at roughly 3 for all gases over a limited low flue gas temperature range, and preliminary theoretical computations made on the basis of broad assumptions have indicated that the ratio may increase with temperature along two separate curves, one for natural and the other for manufactured gas. However, experimental data secured for the express purpose of checking the various viewpoints noted above seems to entirely justify none of the three ideas. Rather consistent experimental data is, notwithstanding, now being secured, and it is hoped that shortly authoritative statements on this point may be made. Only one probability seems so far to have been verified. Apparently, although the carbon monoxide to hydrogen ratio varies with flue gas temperature, it seems at any given temperature to be roughly $1\frac{1}{2}$ times as great when natural gas is the fuel as when manufactured gases are burned.

The problem of ascertaining the value of the ratio in question under all sorts of conditions is far from simple. The ratio of carbon monoxide to hydrogen existing in flue gases seems to depend upon several factors each of which merits serious attention. Those now being studied are: (1) The completeness of the combustion process (per cent excess or deficiency of oxygen), (2) the degree to which water vapor dissociates to form hydrogen and oxygen and carbon dioxide dissociates to form carbon monoxide and oxygen, and (3) the effects of external agencies in retarding or halting prior to their completion various chemical reactions involved in the combustion process.

Monthly Summary of Gas Company Statistics

For Month of May, 1934

Issued July, 1934, by the Statistical Department of the American Gas Association
420 Lexington Avenue, New York, N. Y.

PAUL RYAN, Chief Statistician

COMPARATIVE DATA ON THE MANUFACTURED AND NATURAL GAS INDUSTRY FOR THE MONTH OF MAY

	Month of May			Five Months Ending May 31		
	1934	1933	Per Cent Change	1934	1933	Per Cent Change
Customers						
Domestic (Including House Heating)	14,703,700	14,329,500	+ 2.6			
Industrial and Commercial	744,500	726,600	+ 2.5	*See May*		
Total	15,448,200	15,056,100	+ 2.6			
Revenue (Dollars)						
Domestic (Including House Heating)	41,320,700	42,442,800	— 2.6	244,469,800	245,531,300	— 0.4
Industrial and Commercial	15,162,400	12,977,400	+16.8	81,856,600	70,979,700	+15.3
Total	56,483,100	55,420,200	+ 1.9	326,326,400	316,511,000	+ 3.1

COMPARATIVE DATA ON THE MANUFACTURED GAS INDUSTRY FOR THE MONTH OF MAY

Customers						
Domestic	9,424,800	9,245,500	+ 1.9			
House Heating	95,400	56,400	+69.1			
Industrial and Commercial	440,000	433,300	+ 1.5	*See May*		
Miscellaneous	10,400	8,700	—			
Total	9,970,600	9,743,900	+ 2.3			
Gas Sales (MCF)						
Domestic	20,870,900	21,097,700	— 1.1	104,878,000	105,307,800	— 0.4
House Heating	1,660,400	1,293,300	+28.4	18,995,700	12,736,900	+49.1
Industrial and Commercial	7,459,700	6,141,700	+21.5	37,605,500	30,428,400	+23.6
Miscellaneous	157,500	155,800	—	965,300	938,600	—
Total	30,148,500	28,688,500	+ 5.1	162,444,500	149,411,700	+ 8.7
Revenue (Dollars)						
Domestic	25,223,700	25,698,100	— 1.8	126,156,200	127,962,600	— 1.4
House Heating	1,298,000	957,200	+35.6	12,214,600	9,074,400	+34.6
Industrial and Commercial	5,668,600	5,367,100	+ 5.6	29,368,800	27,510,900	+ 6.8
Miscellaneous	122,600	142,800	—	692,200	713,700	—
Total	32,312,900	32,165,200	+ 0.5	168,431,800	165,261,600	+ 1.9

COMPARATIVE DATA ON THE NATURAL GAS INDUSTRY FOR THE MONTH OF MAY

Customers						
Domestic (Including House Heating)	5,183,500	5,027,600	+ 3.1			
Commercial	268,700	261,200	+ 2.9			
Industrial	23,500	21,800	+ 7.8	*See May*		
Miscellaneous	1,900	1,600	—			
Total	5,477,600	5,312,200	+ 3.1			
Gas Sales (MCF)						
Domestic (Including House Heating)	21,142,500	22,479,600	— 5.9	166,416,800	168,330,700	— 1.1
Commercial	3,436,100	3,480,100	— 1.3	30,858,300	29,646,700	+ 4.1
Industrial	46,707,000	35,556,200	+31.4	232,438,900	178,982,300	+29.9
Miscellaneous	841,600	590,100	—	5,233,700	3,501,700	—
Total	72,127,200	62,106,000	+16.1	434,947,700	380,461,400	+14.3
Revenue (Dollars)						
Domestic (Including House Heating)	14,799,000	15,787,500	— 6.3	106,099,000	108,494,300	— 2.2
Commercial	1,604,100	1,709,700	— 6.2	13,487,400	13,188,200	+ 2.3
Industrial	7,632,100	5,656,900	+34.9	37,442,800	28,931,300	+29.4
Miscellaneous	135,000	100,900	—	865,400	635,600	—
Total	24,170,200	23,255,000	+ 3.9	157,894,600	151,249,400	+ 4.4

Gas Revenues Continue Gains

FOR the five months ending May 31 manufactured and natural gas revenues aggregated $326,326,400, an increase of 3.1 per cent over the corresponding period of 1933. Revenues from domestic customers were practically unchanged. Revenues from industrial and commercial users, however, increased more than 15 per cent over the first five months of 1933.

For the month of May, 1934, manufactured and natural gas revenues aggregated $56,483,100, as compared with $55,420,200 in May, 1933, an increase of 1.9 per cent.

Revenues from gas sales to industrial-commercial users registered a pronounced upturn, aggregating $15,162,400 in May, an increase of nearly 17 per cent over the same month a year ago.

Revenues from sales for domestic uses, such as, cooking, water-heating, refrigeration, etc., were still 2.6 per cent below May, 1933.

Manufactured gas industry revenues in May totalled $32,312,900, practically the same as for the corresponding month a year ago. Revenues from industrial and commercial users of manufactured gas gained 5.6 per cent. Revenues from domestic uses were down 1.8 per cent.

A somewhat similar situation was reflected in the reports of the natural gas companies. Total revenues in May amounted to $24,170,200, a gain of 3.9 per cent over a year ago. Revenues from industrial uses aggregated $7,632,100, representing an increase of nearly 35 per cent. Revenues from domestic users of natural gas, however, registered a loss of 6.3 per cent.

Welsbach Changes

A GENERAL change of officers of the Welsbach Company, Gloucester, New Jersey, has been announced by the management of the United Gas Improvement, Philadelphia.

H. N. Ramsey was elected president to succeed H. R. Martz, who resigned. Mr. Ramsey was also elected to the board of directors of the Gloucester firm.

C. A. Holdcraft, associated with the firm for twenty-five years, was elected treasurer to succeed A. L. Fowler, resigned. Mr. Fowler also retired from the directorate.

F. A. Wegener, also a veteran of twenty-five years with the firm, was elected a director. He has been serving as general manager of the plant since May 1.

W. Findlay Downs, another director, resigned. H. W. Reed was elected a new member of the board.

The company was organized in 1887 and today manufacturers and sells gas water heaters, gas mantles, and other gas appliances.

16th Annual Convention and Exhibition

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AMERICAN GAS ASSOCIATION

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ATLANTIC CITY, N. J.
Week of October 29, 1934

R. J. Canniff Joins Pittsburg Company

THE Pittsburg Water Heater Company has announced the appointment of Robert J. Canniff as general sales manager.

Mr. Canniff is well-known in utility circles having been western sales manager of the Standard Gas Equipment Corporation. His career as an appliance merchandiser began as sales promotion manager of the Central Hudson Gas & Electric Company fourteen years ago. At that time he became active in the American Gas Association being appointed chairman of the Sales Stimulation Committee.

Following his successful chairmanship of this committee, Mr. Canniff was elected chairman of the Commercial Section in October, 1925, and since then he has been active in the section matters serving on the managing committee and advisory council for a number of years.

First Approvals of Hotel and Restaurant Ranges

ANOTHER milestone in the Association's appliance testing and certification program was passed recently when A.G.A. approval was granted, for the first time, to a line of hotel and restaurant ranges. In the June 1, 1934, Supplement of the American Gas Association Laboratory List of Approved Gas Appliances, there appear listing of several models of hotel and restaurant ranges.

The requirements upon the basis of which these approvals were granted have been approved as American Standard by the American Standards Association, and became effective late in 1933.

The Association's endorsement of the hotel and restaurant ranges is noteworthy in that it marks the beginning of a movement which will be of distinct value to commercial consumers of gas. It is expected that additional hotel and restaurant ranges will soon be submitted to the Laboratory for approval. Purchasers of hotel and restaurant equipment may henceforth enjoy the same A.G.A. Seal of Approval for safe and acceptable performance, reasonable convenience, and good construction now so highly regarded by buyers of domestic gas-burning equipment.

METHOD OF AUTHORIZING EXPENDITURES AND AUDITING COST PLUS CONTRACTS

(Continued from page 273)

checks which cover the supporting invoices which are incorporated in the contractor's bills.

Cancelled checks covering the salaries and expenses of contractor's organization including office and field forces are verified with the amount billed. Shop labor is checked from the original time cards against the weekly sheets. Weekly sheets are checked with monthly recapitulation and verified with the amount billed. Rates of shop men are checked with pay roll register.

A detail cost ledger is kept in connection with all cost plus jobs.

Upon completion of a given project, the authorization—Figure 1—is utilized as a certificate of completion and the accounts are closed. Fire insurance carried during construction is then transferred to permanent insurance coverage.

The foregoing is a brief outline of a method that has been in satisfactory use for over ten years. During this period the general plan has been modified from time to time along the lines of simplification. The system outlined above is not something added to the necessary functions of an accounting department, but is merely an elaboration of records that must of necessity be kept in some form or other.

In testing the value of a system of this kind one must measure the cost in the light of the results obtained. It is essential that sound judgment be exercised in determining the extent to which the details are carried. There is always the urge to add one more feature to a system of this kind on the assumption that such addition adds to the value of the result, but it is our judgment from experience that care should be exercised to the end and that the main purpose of the system should be kept in mind.

It can be readily seen that information assembled in the manner prescribed above is extremely useful in carrying out the purposes for which the system is devised. The system has the advantage of gathering the accounting information at a time when the matter is fresh and affords the opportunity to engineers as well as accountants to record the history of the acquisition of property at the outset which is far superior to the results that could be possibly obtained by any attempt to assemble figures at some later period.

Personnel Service

SERVICES OFFERED

Combination Gas and Electric **Utility** man. Expert on meters, experienced Superintendent of distribution, practical engineer. Age 36, speaks English and Spanish. **867.**

Manufacturers agent, graduate engineer, many years' sales experience and unusually wide acquaintance with executives of gas companies, wholesale plumbers and jobbers. Covers eastern territory headquarters in New York City. Excellent sales record and wants an additional non-competing line of interest to present clientele. **869.**

Manager. Due to a consolidation of Gas and Electric properties, a Manager is seeking a change. One with wide practical experience and who has been successful. **871.**

Engineering graduate with several years' varied experience in the design, manufacture, erection and operation of gas plant equipment, and in supervision of plant operation, desires **supervisory** or technical position with small gas company. Married. **872.**

Fourteen years' experience in testing, design and manufacture of gas appliances and controls. Thoroughly familiar with service conditions on all types of gas by personal experience in national laboratory and in the field. Desire permanent or consulting connection with manufacturer, or with gas company in **utilization** and **sales.** **873.**

Gas engineer who has had 3½ years' experience in general operating department of public utility. Past 18 months assistant to superintendent of manufacture, in the production of coal and water gas. Graduate E. E. Age 26. Single. **874.**

Gas engineer technical graduate. Fourteen years' experience in water gas production, distribution, engineering and construction. Design, installation and operation of medium and low pressure distribution systems and high pressure transmission lines. Experienced in heavy oil operation and can produce low production costs. **875.**

Sales representative eighteen years' experience, eight selling, desires position to specialize in the sale of automatic gas water heaters, gas refrigeration, or hotel equipment, gas company or manufacturer; have own car. Married (38). **876.**

Gas engineer, technical graduate, N. Y. State Engr. License, post-graduate work in utility economics and accounting. Six years broad practical experience covering manufacture of oven, retort, and water gas—utilization—construction—customer's service—and high and low pressure distribution. Desire an executive position with small company. Will go anywhere. Married. (28). **877.**

Industrial gas sales engineer, six years' experience, large Eastern combination company, sales, installation and service of varied industrial applications, bake ovens, boilers, furnaces, etc. Familiar with all competitive fuels, preparation of estimates, cost surveys, and economical rate determinations. University graduate, 34, married. **878.**

Experienced and proven **sales manager** and salesman, who has successfully established steady, volume sales to Eastern and midwestern gas companies, wants to act as distributor in these territories for one or two quality lines of reliable manufacturers. Particularly for appliances, engineering specialties or gas distribution materials. **879.**

Experienced man, thorough knowledge installation and operation of **Property Accounting** methods constituting perpetual inventory. Familiar with requirements Uniform System of Accounts ré fixed capital in utility property in New York, well versed in special reports, exhibits and statistical compilation for rate making. **880.**

Sales engineer (36) married; two years erection and sales for large manufacturer industrial furnaces; four years supervisor of industrial, commercial and house heating for large eastern utility company and four years with world's largest air conditioning manufacturer, invites correspondence and investigation of gas company officials desirous of obtaining new business. **881.**

SERVICES OFFERED

Manufacturer's distributor, gas ranges and appliances, New Jersey, New York and Pennsylvania; wide experience in sales among utilities, leading department stores, stove jobbers, plumbers, and builders. **882.**

Manager, superintendent or **engineer** with unusually varied experience in operating and management covering coal, water and oil gas. Reforming of natural gas. Mixed and straight natural gas distribution changeover. Aggressive. **883.**

Gas service engineer experienced on construction, steel or cast-iron pipe, distribution systems or transmission line, regulator and meter stations. Also domestic and industrial appliance installations. Natural or manufactured gas. **884.**

Salesman, stoves, furnaces, boilers and radiation. Over twenty-five years' experience, all general office details, credits, collections, sales promotion, sales customers claims and traffic. Wide acquaintance among furniture, hardware and department store trade in Northern Ohio and Michigan; also specialist in warm air heating. **885.**

Man (47) with wide experience as a public utility **manager,** gas, electric, water and sewer, desires job as manager of fair-sized company or group of smaller companies. Engineering, supervising and managing since 1910. **886.**

Gas engineer (39). Recently manager of small company. Experienced water gas and coke oven operator. Fifteen years' experience in natural gas measurement, distribution and industrial uses, in public relations, rate structures and promotion and sale of all types of gas appliances. **887.**

Manager for medium sized gas property, familiar with manufacture of coal and water gas. Experience with natural gas distribution and utilization. Excellent record as merchandiser. Salary secondary. **888.**

Technically trained **engineer** with adequate experience in operation, valuation, expert testimony, trade relations, customer relations, employee information, technical and statistical studies, and house organ publication. Gas and electric experience under most thorough state regulation. **889.**

Appliance sales, sales promotion and new business **manager** with utility or live dealer organization. Understand gas and electric ranges, water heaters and small appliances. Know how to supervise cooking schools, location, Southern States preferred. **890.**

Accountant-Statistician. Twelve years' broad experience with large gas company in costs, analysis, statistics, rate case preparation, office organization, financial statements, branch office audits, accounting forms, and procedures. University trained. **891.**

Manager-engineer; thirty years' experience design and construction of plants, distribution systems and transmission lines. Organization, operation, management, sales, engineering, valuations, coal water and natural gas, also electricity. Recent experience with heavy oil for water gas and high b.t.u. gas to supplement natural gas. **892.**

District regulator repairman, expert on all makes. Seven years in present position, wish to make a change, will go anywhere, married. **893.**

Gas Engineer, experienced in manufacture, application of gas meters, all types, controls and regulation; gas plant operation and maintenance experience; also, utility management training with nationally known engineering firm. Desires position as asst. engineer or asst. superintendent of measurement, distribution—married (30). Free to locate. Natural Gas preferred. **894.**

Successful **Industrial Gas Engineer** desires position where a large potential market awaits progressive efforts and where results will be rewarded. Twenty-three years' experience Natural and Manufactured gas. Thorough knowledge all phases industrial applications, from steam boiler to steel mills. **895.**

SERVICES OFFERED

Mechanical Engineer, college graduate, 8 years' experience H. P. and L. P. distribution, water and coal gas production, appliance servicing, natural gas changeover. Desires position as superintendent or manager. Married. Location immaterial. Available immediately. **896.**

Industrial Sales Engineer desires employment with Eastern Utility. Specialized in Sales Management, Service and Maintenance of House Heating Department, Industrial Steam Boilers and Large Volume Water Heating. Broad general and technical experience. Married. **897.**

Engineer, now employed offers manufacturer or utility benefits of ten years' experience in all phases of heating and air-conditioning; designing, manufacturing, patents, etc. Background of 7 years in technical college faculty, national society committee activities, writing, and speaking; with high professional standing and wide acquaintance in the industry. **898.**

Gas Engineer and **Manager** (45) University graduate, twenty-three years in executive position, including coal, ovenwater and natural gas, high and low pressure distribution, pipe line design, natural gas conversion work, house heating, industrial sales and all other branches of the gas industry in both large and small situations. **899.**

You'll like this man. His natural flair for selling is seasoned by 11 years' honest, intensive work. Harvard graduate; salesman, 6 years; advertising agency executive, 2 years; utility advertising manager, 2 years; manager newspaper chain, one year. Can cooperate. Can get results. Wants **sales** or **advertising** position with future. **900.**

Personnel Director with emphasis on education. Have had 10 years' experience in one of the largest gas and electric utility companies in the United States. Leadership in education in the public utility field established and recognized at home and abroad. The same standard can be set again with low overhead. **901.**

Commercial Manager with tact, vision, creativeness, resourcefulness and "punch"; unusually successful record as load builder; broad experience with progressive organizations U. S. and Canada supervising domestic and industrial sales, developing economies, analysing and allocating costs, designing rates, handling advertising, publicity, franchises, State Commission and public relations. Expert negotiator; highest credentials. **902.**

Sales Engineer, one of the pioneers of gas House-heating sales with a background of gas plant operation. Have also had industrial sales, summer air conditioning, sales promotion and dealer relations experience. Prefer eastern states. Married. **903.**

POSITIONS OPEN

Gas Appliance **Salesman** wanted. Progressive, established manufacturer of radiant and circulating heaters wants experienced representatives for Texas. One having both dealer and utility experience preferred. Commission basis, with possibility of drawing account. State age, experience, full qualifications. Unusual opportunity. **0270.**

Manufacturer of well-known line of automatic temperature, pressure and flow controls used for domestic, commercial and industrial purposes is desirous of obtaining **Manufacturer Distributors** in a number of eastern and mid-western states. Prefer man or organization who is control minded and contacts public utilities and heating contractors through his territory. Must have best references. Straight commission basis. **0275.**

Auditors and **Accountants,** supervising type; also juniors, with gas, electric, water, telephone or steam experience, for *temporary* work. Personnel Service inserts this notice, inviting *unemployed* individuals interested in temporary work to submit complete details of experience and qualifications. **0276.**

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